

7/185

31/11
 TGG CCG GGT CCG GGA GGT AGA TAA TAG CTC ACC GTT GGA CGA CTT CGA CAG GGT CTT TTG
 ser pro ala arg gly arg arg CCH AMB leu thr val gly arg pro arg gln gly pro leu
 51/21 51/31
 TGA CTG CCG GGC TTG AGG CCG ACC ACC ACA GAG TCG GGT CAT CCG CTA AGG CTA CCG TTC
 GPA leu pro gly leu thr arg thr thr thr glu ser gly his arg leu arg leu pro phe
 121/41 151/51
 TGA CCT GGG GTC CTT GGG CCG CGA CGA GTG AGG CAG TCA TGT CTC AGG GGC CAC CCG CAC
 GPA pro gly val arg gly arg arg arg val arg gln ser cys leu arg ala his arg his
 181/61 211/71
 CTC GGT CCG CCG CAG TGT CAG CAT GTC CAG ATG ACT CCA CCG AGC TTG TTC GTG TTC GTG
 leu gly arg arg gln cys gln his val gln met thr pro arg ser leu phe val leu val
 241/81 271/91
 TCG TGG TTG CGA CGA CTT GGC GCT GGT GAG CCG ACC CCG GGG CTT CTT GGC CCG CAT GCG
 ser trp leu arg arg leu gly ala gly glu arg thr arg arg arg arg ala ala his ala
 301/101
 GAT C
 asp

SEQ ID N° 3A

FIGURE 3A

32/11
 CCG CCG CTC GCG GAC GTA GAT AAT AGC TCA CCG TTG GAC GAC CTC GAC AGC GTC CTT TGT
 arg arg leu ala asp val asp asn ser ser pro leu asp asp leu asp arg val leu cys
 42/21 92/31
 GAC TGC CCG GCT TGA CCG GGA CGA CGA CAG AGT CCG CTC ATC GCG TAA GCG TAC CGT TCT
 asp cys arg ala GPA arg gly arg pro gln ser arg val ile ala CCH gly tyr arg ser
 122/41 152/51
 GAC CTC GCG TGC GTC GGC GCC GAC GAG TGA GCG AGT CAT GTC TCA GCG CCG ACC GCG ACC
 asp leu gly cys val gly ala asp glu GPA gly ser his val ser gly pro thr ala thr
 182/61 212/71
 TCG CTC GCG GCG AGT CTC AGC ATG TGC AGA TGA CTC CAC GCA GCT TGT TCG TGT TCG TGT
 ser val ala gly ser val ser met cys arg GPA leu his ala ala cys ser cys trp cys
 242/81 272/91
 CTT GGT TGC GAC GAC TTG CCG CTC CTC AGC CCA CCG GCG GCG GTC GTG CCG CCG ATG CCG
 arg gly cys asp asp leu ala leu val ser ala pro ala gly val val pro arg met arg
 302/101
 ATC
 ile

SEQ ID N° 3B

FIGURE 3B

8/185

33/11
 GCC GGC TCG CGG ACG TAG ATA ATA GGT CAC GGT TGG ACC ACC TCG ACA GGG TCG TTT GTG
 ala gly ser arg thr AMB ile ile ala his arg trp thr thr ser thr gly ser phe val
 63/21
 ACT GCC GGG GTT GAC GCG GAC GAC CAC AGA GTC GGG TCA TCG CCT AAG GGT ACC GTT CTG
 thr ala gly leu asp ala asp asp his arg val gly sec ser pro lys ala thr val leu
 123/41
 ACC TGG GGT GCG TGG GCG GCG ACG AGT GAG GCA GTC ATG TCT CAG GCG CCA CCG CCA GGT
 thr trp gly ala trp ala pro thr ser glu ala val met ser gln gly pro pro pro pro
 183/61
 CCG TCG CCG GCA GTG TGA GCA TGT GCA GAT GAC TCG ACC CAG GTT GTT COT GTT GGT GTC
 arg ser pro ala val ser ala cys ala asp asp ser thr gln leu val arg val gly val
 243/81
 GTG GTT GCG ACC ACT TGG CCG TGG TGA GCG GAC CCG CCG GCG TCG TCG CCG GCA TCG GGA
 val val ala thr thr trp arg trp OFA ala his pro pro ala ser cys arg ala tys gly

TC

SEQ ID N° 3C

FIGURE 3C

31/11
 CCA ATT TTC CTT CCG GCG GTG CAA TAG CAT CTG CAA GAC CAG CCA CCG CCG GTG GTT GCG
 pro ile phe leu arg ala val gln tyr his leu gln asp gln arg arg pro val val ala
 61/21
 GTC GCG CAG CTT CCG GAA ACC GCG TAT GGA GCG TGC TGT ACC GTT GTT GCG ACT TGA TGT
 val ala gln leu ala glu thr gly tyr gly pro pro arg thr val val ala thr OFA cys
 121/41
 CGT GCG TCT CCA CCG GTC GGG GGG CCA AAG CCA TTC CCA CAC TGG GAT CCT CAA AAC CTC
 arg arg ser pro pro val gly gly arg lys pro phe arg his trp asp pro gln asp val
 181/61
 GGC TGA GTG TCT GCA GCG CTC CCG GGA GCA GCG GAT CAT CAC CAT GTA CCA ACT GAA TAA
 gly OFA val ser ala gly leu arg gly ala ala asp his his his val arg thr gln GCH
 241/81
 GTC CCG CCG GCG CCA GTT CCA GAC ATT TGT GGT TTC GGT TGA GCG CCA GCG CAG GGT
 val pro arg ala arg leu pro asp ile cys cys gly phe gly OFA gly arg gly glu ala
 301/101
 CAT TTC GCA GCA ACC GGT CTC GGG GTC GCA GCA TCG TTS GCG CCA TCG CCG CCG ACT CBT
 his phe ala ala thr gly leu arg val ala ala ser leu arg arg ser arg arg ser arg
 361/121
 CCG ACC AGT GGT GGT CAA CCA CCA CCA TC
 arg thr ser arg arg gln arg pro arg

SEQ ID N° 4A

FIGURE 4A

9/185

32/11
 CAA TTT TCC TTC GCG CCG TGC AAT ACC ATC TGC AAG ACC AGC GAC GGC CCG TGC TTG CCG
 gln phe ser phe ala pro cys asn thr ile cys lys thr ser asp gly pro trp leu arg
 62/21
 TCG CCG AGC TTG CCG AAA CCG GGT ATG GAC CCT GCG GTA CCG TTG TTG CCA GTT GAT GTC
 ser arg ser leu arg lys pro gly met asp pro ala val pro leu leu pro leu asp val
 122/41
 GTC GCT CTC CAC CCG TCG GGG GGC GAA AGC CAT TCG GAC ACT GGG ATC CTC AAA AGC TCG
 val ala leu his pro ser gly gly glu ser his ser asp thr gly ile leu lys thr ser
 182/61
 GCT GAG TGT CTG CAG GGC TCC GGG GAG CAG CCG ATC ATC ACC ATG TAC GAA CTG AAT AAG
 ala glu cys leu glc gly ser gly glu gln pro ile ala thr met tyr glu leu asn lys
 242/81
 TCC CCG GCG CCG GAC TTC CAG ACA TTT GTT GTG GTT TCG GTT GAG GCG GAG GCG AGG CTC
 ser pro ala arg asp phe gln thr phe val val val ser val glu ala glu ala arg leu
 302/101
 ATC TCG CAG CAA CCG CTC TCC CCG TCG CAG GAT GGT TCG GCG GAT CCG GCG GGA CTC GTC
 ile ser gln gln pro val ser gly ser gln his arg cys gly asp arg gly ala val val
 362/121
 GGA CGA CTC GTC CTC AAC GAC CAC GAT C
 gly arg val val val asn asp his asp

SEQ ID N° 4B

FIGURE 4B

33/11
 AAT TTT GCT TCG CCG GGT GCA ATA CCA TCT GCA AGA CCA GCG AGC GCC CGT GGT TGC GGT
 asn phe pro ser arg arg ala ile pro ser ala arg pro ala thr ala arg gly cys gly
 63/21
 CCG GCA GGT TGC CCA AAC CCG GTA TGG ACC CTG CCG TAC CGT TGT TCG CAC TTG ATG TCG
 arg ala ala cys gly asn arg val trp thr leu pro tyr arg cys cys his leu met ser
 123/41
 TCG CTC TCC ACC GGT CCG GGG GCG AAA GCG ATT CCG ACA CTG GGA TCC TCA AAA CGT CCG
 ser leu ser thr arg arg gly ala lys ala ile pro thr leu gly ser ser lys arg arg
 183/61
 CTG ACT GTC TGC AGG GGT CCG GGG AGC AGC CGA TCA TCA CCA TGT ACG AAC TGA ATA AGT
 leu ser val cys arg ala pro gly ser ser arg ser ser pro cys thr asn asp ile ser
 243/81
 CCG CCG CCG CCG ACT TCG AAA CAT TTG TTG TGG TTT CCG TTG AGC CCG AGG CGA GCG TCG
 pro pro arg ala thr ser arg his leu leu trp phe arg leu arg pro arg arg gly ser
 303/101
 TTT GCG ACC AAC CCG TCT CCG GGT CCG ACC ATC GTT CCG GCG ATC GCG GCG CAG TCG TCG
 phe acc ser asn arg ser pro gly arg ser ile val ala ala ile ala ala gln ser ser
 363/121
 GAC GAG TGG TGG TCA ACG ACC AGC ATC
 asp glu ser ser ser thr thr thr ile

SEQ ID N° 4C

10/185

partie de la séquence nucléotidique de seq4A

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1/1                               31/31
CCG CGC GCG ACT TCC AGA CAT TTG TTG TGC TTT CCG TTS AGG CCG AGG CGA GGC TCA TTT
pro arg ala thr ser arg his leu leu trp phe arg leu arg pro arg arg gly ser phe
61/21                               31/31
CGC AGC AAG CCG TCT CCG GGT CCG AGC ATC GTT CCG GCG ATC GCG CCG CAG TCG TCG GAC
arg ser lys arg ser pro gly arg ser ile val ala ala ile ala ala gly ser ser asp
121/41
GAG TCG TCG TCA ACC ACC AGG ATC
glu ser ser ser thr thr thr ile

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SEQ ID N° 4A'

FIGURE 4A'

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1/1                               31/31
CCG CGC CGA GTT CCA GAC ATT TGT TGT GGT TTC GGT TGA GGC CGA GGC GAG GGT CAT TTC
arg ala arg leu pro asp ile cys cys gly phe gly CCA gly arg gly glu ala his phe
61/21                               31/31
GCA GCA AGC GGT CTC CCG GTC GCA GCA TCG TTG CCG CGA TCG CCG CCG AGT GGT CCG AGC
ala ala ser gly leu arg val ala ala ser leu arg arg ser arg arg ser arg arg thr
121/41
AGT GGT GGT CAA CGA CCA CGA TC
ser arg arg glu arg pro arg

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SEQ ID N° 4B'

FIGURE 4B'

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1/1                               31/31
GGC GGC CCG GAC TTC CAG ACA TTT GTT GTC GTT TCG GTT CAG GCG CAG GCG AGG CTC ATT
ala ala arg asp phe glu thr phe val val val ser val glu ala glu ala arg leu ile
61/21                               31/31
TCG CAG CAA GCG GTC TCG GCG TCG CAG CAT GGT TGC GGC GAT CCG GGC GCA GTC GTC GCA
ser glu glu ala val ser gly ser glu his arg cys gly asp arg gly ala val val gly
121/41
CGA GTC GTC GTC AAC GAC CAC GAT C
arg val val val ser asp his asp

```

SEQ ID N° 4C'

FIGURE 4C'

11/185

ORF d'après par Cole et al. (Nature 353:537-544) et contenant la séquence Seq 4A'

1/1 31/11
 tga ata agt cgg cgg cgg cgg act tcc aga cat ttg ttg tgg ttt cgg ttg agg cgg agg
 gpa ile ser pro pro arg ala thr ser arg his leu leu trp phe arg leu arg pro arg
 61/21 91/31
 cga ggc tca ttx cgc agc aag cgg tct cgg ggt cgc agc aac gtt cgg cgg att cgg cgg
 arg gly ser phe arg ser lys arg ser pro gly arg ser ile val ala ala ile ala ala
 121/41 151/51
 cag tgg tgg gac gag tgg tgg tca acg acc acg atc cgg aac tgg acg ccc tcc tgt tgg
 gln ser ser asp glu ser ser ser thr thr thr ile ser asn ser thr pro ser cys ser
 181/61 211/71
 agg atg cta cgc aga cag cgc tgg atg gty cgg cgg ttg ttg tcc atc ggg atg ccc acc
 arg met leu arg arg gln arg ser met val ala pro leu leu tyr ile gly met his thr
 241/81 271/91
 gag ata agc ggt ttc gcc ggg ttc acc gat acc acg att gat gca tca cca ggg acc acc
 glu ile ser gly phe ala gly phe thr asp thr thr leu asp ala ser pro gly thr thr
 301/101
 tgg cga ctc aga gac tag
 trp arg leu arg asp AMB

SEQ ID N° 4F

FIGURE 4F

séquence en amont de seq4A' et en fusion avec seq4A'

1/1 31/11
 gca acc tac cag cag acc cag ggc ctc aca gca cct aaa gaa gta gcc ccc atg gct gat
 ala thr tyr gln gln ser gln gly leu thr gly pro lys gly val ala pro met ala asp

C

SEQ ID N° 4J

FIGURE 4J

seq40' dans une autre phase de lecture

1/1 31/11
 acc caa cct acc acc aga gcc agg gcc tca cag gac cta aag gag tag ccc cca tgg ctc
 thr gln pro thr ser arg ala arg gly ser gln asp leu lys glu amb arg pro trp leu
 61/21
 atc
 ile

SEQ ID N° 4K

FIGURE 4K

seq 43' dans la troisième phase de lecture

1/1 31/11
 cgc aac cta cca gca gaa cca gcc cct cac acc acc taa agg act agc gcc cgt cgt tga
 acc aac leu pro ala glu pro gly ala his arg thr cch arg ser ser ala his gly gpa

TC

SEQ ID N° 4L

FIGURE 4L

FEUILLE DE REMPLACEMENT (REGLE 26)

12/185

séquence Rv2050 prédire par Cole et al. (Nature 393:537-544) et contenant seq43
 1/1 31/31
 ATG GCT GAT CGT GTC CTG AGG GCG AGT CGC CTC GGA GCC GTC AGC TAT GAG ACC GAC CGC
 Met ala asp arg val leu arg gly ser arg leu gly ala val ser tyr glu thr asp arg
 61/21 61/31
 AAC GAC GAC CTG GCG CCG CGC CAG ATC GCG CCG TAC CCG ACC GAC AAC GGC GAG GAG TTC
 asn his asp met leu ala pro arg gln ile ala arg tyr arg thr asp asn gly glu glu phe
 121/41 151/51
 GAA GTC CCG TTC GGC GAT GAC GGC GAG ATC CCG GGC ACC TGG TTG TGC CCG AAC GGC ATG
 glu val pro phe ala asp asp ala glu ile pro gly thr trp leu cys arg asn gly met
 181/61 211/71
 GAA GGC ACC CTG ATC GAG GGC GAC CTG CCG GAG CCG AAG AAG GTT AAG CCG CCC CCG ACC
 glu gly thr leu ile glu gly asp leu pro glu pro lys lys val lys pro pro arg thr
 241/81 271/91
 CAC TGG GAC ATG CTG CTO GAG GCG CGT TCC ATC GAA GAA CTC GAA GAG TTA CTT AAG GAG
 his trp asp met leu leu glu arg arg ser ile glu glu leu glu leu leu lys glu
 301/101 331/111
 CCG CTC GAG CTC ATT CGG TCA CGT GCG CCG GCG TGA
 arg leu glu leu ile arg ser arg arg arg gly GPA

SEQ ID N° 4M

FIGURE 4M

ORF d'après par Cole et al. (Nature 393:537-544) et contenant la séquence Rv2050
 1/1 31/31
 TAG TCC GCG CCG GTC TCG GAT CCG GGT ATC ATT GAT GGT CCG GCG CCG CCG GTC GCG TCG
 AMB ser ala arg val ser asp pro gly ile ile asp gly arg ala ala arg val ala cys
 61/21 91/31
 CCG GAA CTA CCG AGA CCG CCG CAG CGT TTS CCA ACC GGA GCG AGT CCG CAG TAC GGA ACC
 arg glu leu arg arg arg pro gln arg leu pro thr gly ala ser arg gln tyr ala thr
 121/41 151/51
 TAC CAG CAG ACC CCA GGG CTC ACA GGA CTT AAA GGA GTA GCG CCG ATC GGT GAT GGT CTC
 tyr gln glu ser pro gly leu thr gly pro lys gly val ala pro met ala asp arg val
 181/61 211/71
 CTG AGG GCG AAT CCG CTC GGA GCG GTC AGC TAT GAG ACC GAC CCG AAC CAC GAC CTG CCG
 leu arg gly ser arg leu gly ala val ser tyr glu thr asp arg asn his asp leu ala
 241/81 271/91
 CCG GCG CAG ATC GCG CCG TAC CCG ACC GAA GCG GCG GAG TTT GAA CTC CCG TTC GCG
 pro arg gln ile ala arg tyr arg thr asp asn gly glu glu phe glu val pro phe ala
 301/101 331/111
 GAT GAC GCG GAG ATC CCG GCG ACC TGG TTG TCG CCG AAC GGC ATG GAA GCG ACC CTC ATC
 asp asp ala glu ile pro gly thr trp leu cys arg asn gly met glu gly thr leu ile
 361/121 391/131
 GAG GCG AAC CTG CCG GAG CCG AAG AAG GTT AAC CCG CCG CCG ACC CAC TGG GAC ATC CTC
 glu gly asp leu pro glu pro lys lys val lys pro pro arg thr his trp asp met leu
 421/141 451/151
 CTG GAG CCG CGT TCC ATC GAA GAA CTC GAA GAG TTT CTT AAG GAG CCG CTC GAG CTC ATT
 leu glu arg arg ser ile glu glu leu glu glu leu leu lys gln arg leu glu leu ile
 481/161
 CCG TCA CGT CCG CGG GCG TGA
 arg ser arg arg arg gly GPA

SEQ ID N° 4N

FEUILLE DE REMPLACEMENT (REGLE 26)

13/185

31/11
 GAT CGC GGT CAA CGA GGC CGA ATA CGG CGA GAT GTG GGC CCA AGA CGC CGC CGC GAT GTT
 asp arg gly gln arg gly arg ile arg arg asp val gly pro arg arg arg arg asp val
 61/21
 TGG CTA CGC CGC GGC GAC GGC GAC GGC GAC GGC GTT GCT GCT GCT CGA CGA GGC GGC
 trp leu arg arg gly asp gly asp gly asp gly asp val ala ala val arg gly gly ala
 121/41
 131/51
 GGA GAT GAC CAG CGC GGC TGG GCT CCT CGA GCA GGC CGC GGC GGT CGA GGA GGC CTC CGA
 gly asp asp gln arg gly trp ala pro arg ala gly arg arg gly arg gly gly leu arg
 181/61
 CAC CGC CGC GGC GAA CCA GTT GAT GAA CAA TGT GGC CCA GGC GGT GCA ACA GGT GGC CCA
 his arg arg gly glu pro val asp glu gln cys ala pro gly ala ala thr ala gly pro
 241/81
 GGC CAC GCA GGG CAC CAC GGC TTC TTC CAA GCT GCG TGG GCT GTC GAA GAC GGT CTC GGC
 ala his ala gly his his ala phe phe gln ala gly trp pro val glu asp gly leu ala
 301/101
 GCA TGG GTC GGC GAT C
 ala ser val ala asp

SEQ ID N° 5A

FIGURE 5A

32/11
 ATC CGC GTC AAC GAG GGC GAA TAC GGC GAG ATG TGG GGC CAA GAC GGC GGC CGG ATG TTT
 ile ala val asn glu ala glu tyr gly glu met trp ala gln asp ala ala ala met phe
 62/21
 GGC TAC GGC CGC GCG ACG GCG ACG GGC ACG GGC ACG TTA CTA CCG TTC GAG GAG GGC CGC
 gly tyr ala ala ala thr ala thr ala thr ala thr leu leu pro phe glu glu ala pro
 122/41
 132/51
 GAG ATG ACC AGC GCG GGT GGG CTC CTC GAG CAG GGC GGC GCG GTC GAG GAG GGC TCC GAC
 glu met thr ser ala gly gly leu leu glu gln ala ala ala val glu glu ala ser asp
 182/61
 ACC GGC GCG GCG AAC CAG TTG ATG AAC AAT GTG GGC CAG GCG CTC CAA CAG CTC GGC CAG
 thr ala ala ala asn gln leu met asn val pro gln ala leu gln gln leu ala gln
 242/81
 272/91
 GGC ACG CAG GGC ACC ACG CCT TCT TCC AAG CTG GGT GGC CTC TGG AAG ACC GTC TCG CGC
 pro thr gln gly thr thr pro ser ser lys leu gly gly leu trp lys thr val ser pro
 302/101
 CAT CGC TCG CGC ATC
 his arg ser pro ile

SEQ ID N° 5B

FIGURE 5B

14/185

33/11
 TCG CCG TCA ACG AGC CCG AAT ACG GCG AGA TGT GGG CCC AAG ACG CCG CCG CCA TGT TTG
 ser arg ser thr arg pro asn thr ala arg cys gly pro lys thr pro pro arg cys leu
 63/21
 GGT ACG CCG CCG CGA CCG CGA CCG CGA CCG CGA CCG TGC TGC CCG TCG AGG AGG CCG CCG
 ala thr pro arg arg arg arg arg arg arg arg arg arg cys cys arg ser arg arg arg arg
 123/41
 AGA TGA CCA CCG CCG GTG GGC TCC TCG AGC AGG CCG CCG CCG TCG AGG AGG CCG CCG ACA
 arg GPR pro ala arg val gly ser ser ser arg pro pro arg ser arg arg pro pro thr
 183/61
 CCG CCG CCG CGA ACC AGT TGA TGA ACA ATG TGC CCC AGG CCG TGC AAC AGC TGG CCC AGC
 pro pro arg arg thr ser GPR GPR thr met cys pro arg arg cys asn ser trp pro ser
 243/81
 CCA CCG AGG GCA CCA CCG CTT CTT CCA AGC TGG GTG GTC TGT GGA AGA CCG TCT CCG CCG
 pro arg arg ala pro arg leu leu pro ser trp val ala cys gly arg arg ser arg arg
 303/101
 ATC GGT CCG CGA TC
 ile gly arg arg

SEQ ID N° 5C

FIGURE 5C

partie de la séquence nucléotidique Seq 5A

1/1 31/11
 CCG CCG GGC GAC GGC GAC GGC GAC GGC GAT GCT GGC GTT CCA GCA GGC GGC GCA GAT
 arg arg gly asp gly asp gly asp gly asp val ala ala val arg gly gly ala gly asp
 61/21
 GAC CAG CCG GGG TGG GCT CCT CCA GCA GGC CCG CCC GGT CCA GGA GGC CTC CGA CAC CCG
 asp gln arg gly trp ala pro arg ala gly arg arg gly arg gly gly leu arg his arg
 121/41
 CCG GGC GAA CCA GTT GAT GAA CAA TGT GCC CCA GGC GGT GCA ACG GGT GGC CCA GCC CAC
 arg gly glu pro val asp glu gln cys ala pro gly ala ala thr ala gly pro ala his
 181/61
 GCA GGG CAC CAC GGC TTC TTC CAA GCT GGG TGG CCG GTG GAA GAC GGT CTC GCC GCA TCG
 ala gly his his ala phe phe gln ala gly trp pro val glu asp gly leu ala ala ser
 241/81
 GTC GCC GAT C
 val ala asp

SEQ ID N° 5A'

FIGURE 5A'

15/185

1/1 31/11
 TAC GCC GCG GCG ACC GCG ACC GCG ACC GCG ACC TGC CTG CCG TTC GAG GAG GCG CCG GAG
 tyr ala ala ala thr ala thr ala thr ala thr leu leu pro phe glu glu ala pro glu
 61/21 91/31
 ATG ACC ACC GCG GGT GGG CTC CTC GAG CAG GCC GCC GCG GTC GAG GAG GCC TCC GAC ACC
 met thr ser ala gly gly leu leu glu gln ala ala ala val glu glu ala ser asp thr
 121/41 151/51
 GCC GCG GCG AAC CAG TTG ATG AAC AAT GTG CCC CAG GCG CTG CAA CAG CTG GCC CAG CCC
 ala ala ala asn gln leu met asn asn val pro gln ala leu gln gln leu ala gln pro
 181/61 211/71
 ACG CAG GCG ACC ACC CCT TCT TCC AAG CTG GGT GCG CTG TGG AAG ACC GTC TCG CCG CAT
 thr gln gly thr thr pro ser ser lys leu gly gly leu trp lys thr val ser pro his
 241/81
 CGG TCG CCG ATC
 arg ser pro ile

SEQ ID N° 5B'

FIGURE 5B'

1/1 31/11
 AGC CCG CCG CGA CCG CGA CCG CGA CCG CGA CCG TGC TGC CCG TGC AGG AGG CCG CCG AGA
 thr pro arg arg arg arg arg arg arg arg arg cys cys arg ser arg arg arg arg arg
 61/21 51/31
 TGA CCA GCG CCG GTC GGC TCC TCG AGC AGG CCG CCG CCG TCG AGG AGG CCG CCA CCA CCG
 opa pro ala arg val gly ser ser ser arg pro pro arg ser arg arg pro pro thr pro
 121/41 151/51
 CCG CCG CGA ACC AGT TGA TGA ACA ATG TGC CCC AGG CCG TGC AAC ACC TGG CCC AGC CCA
 pro arg arg thr ser opa opa thr met cys pro arg arg cys asn ser trp pro ser pro
 181/61 211/71
 CGC AGG GCA CCA CCG CTT CTT CCA AGC TGG CTG GCG TGT GGA AGA CCG TCT GCG CCG ATC
 arg arg ala pro arg leu leu pro ser trp val ala cys gly arg arg ser arg arg ile
 241/81
 GGT CCG CGA TC
 gly arg arg

SEQ ID N° 5C'

FIGURE 5C'

16/185

ORF prédite par Cole et al. (Nature 393:537-544) et contenant seq5A'

1/1 31/11
 tga act gat gat tct gat agc gac caa cct ctt ggg gca aaa naa ccc ggc gat cgc ggt
 OPA thr asp asp ser asp ser asp gln pro leu gly ala lys his pro gly asp arg gly
 51/21 91/31
 caa cga ggc cga ata cgg cga gat gty ggc cca aga cgc cgc cgc gat gtt tgg ata cgc
 gln arg gly arg ile arg arg asp val gly pro arg arg arg asp val trp leu arg
 121/41 151/51
 cgc ggc gac ggc gac ggc gat ggc gac gtt gct gcc gtc cga gga ggc ggc gga gat gac
 arg gly asp gly asp gly asp val ala ala val arg gly gly ala gly asp asp
 181/61 211/71
 cag cgc ggg tgg gct cct cga gca ggc cgc cga ggt cga gga ggc ctc cga cgc cgc
 gln arg gly trp ala pro arg ala gly arg arg gly arg gly leu arg his arg arg
 241/81 271/91
 ggc gaa cca gtn gat gaa caa tgc gcc cca ggc gct gca aca gct ggc cca gcc cac gca
 gly glu pro val asp gln gln cys ala pro gly ala ala thr ala gly pro ala his ala
 301/101 331/111
 ggg cac caa gcc ttc ttc caa gct ggg tgg cct gty gaa gac ggt ctc gcc gca tgc gtc
 gly his his ala phe phe gln ala gly trp pro val glu asp gly leu ala ala ser val
 361/121 391/131
 gcc gat cag caa nat ggt gtc gat ggc caa caa cat gtc gat gac caa ctc ggc tgt
 ala asp yln gln his gly val asp gly gln gln pro his val asp asp gln leu gly cys
 421/141 451/151
 gtc gat gat caa nac ctt gag ctc gat gtt gaa ggg ctt tgc tcc ggc ggc ggc cgc cca
 val asp asp gln his leu glu leu asp val glu gly leu cys ser gly gly gly arg pro
 481/161 511/171
 ggc cgt gca aac cgc ggc gca aaa ggc ggt cgc ggc gat gag ctc gct ggc cgc ctc gct
 gly arg ala asn arg gly ala lys arg gly pro gly asp glu leu ala gly gln leu ala
 541/181 571/191
 ggc ttc ttc ggg tct ggg cgg tgg ggt ggc cgc cca ctt ggg tgc ggc ggc ctc ggt cgc
 gly phe phe gly ser gly arg trp gly gly arg gln leu gly ser gly gly leu gly arg
 601/201 631/211
 ttc gtt gtc ggt gcc gca ggc ctg ggc cgc ggc cca ccc ggc agc ccc ccc ggc gcc gcc
 phe val val gly ala ala gly leu gly arg gly gln pro gly ser his pro gly gly ala
 661/221 691/231
 ggc gct gcc gct gac cag cct gac cag cgc cgc ggc aag agc gct cgt gca gat gct ggc
 gly ala ala ala asp gln pro asp gln arg arg gly lys arg ala arg ala asp ala gly
 721/241 751/251
 cgc gct gcc ggt ggc gca gat ggc cgc cgc cgc cgc ggc ggc ggc ggc ggc ggc ggc
 arg ala ala gly gly ala asp gly arg gln gly arg asp trp ala gln trp cys ala ala
 781/261 811/271
 tgt tcc gcc ggc gcc cta tgt gat gcc gca tcc tcc ggc ggc cgc cta gga gag ggc gcc
 cys aac ala ala thr leu cys asp ala ala phe ser gly gly arg leu gly glu gly ala
 841/281
 cag aat gtc gtt aat tga
 gln thr val val ile OPA

SEQ ID N° 5F

FIGURE 5F

17/185

séquence Avil96 prédite par Cole et al. (Nature 393:537-544) et pouvant coder pour une ORF en fusion avec Seq5A:

1/1 31/11
atg gtc gat tcc ggg ggg tta cca ccc gag atc aac tcc ggc agc arg tac gcc ggc ccc
Mec val asp phe gly ala leu pro pro glu lle asu ser ala arg met tyr ala gly pro
61/71 91/31
ggc tgc gcc tcc ctg gtc gcc ggc gcc cag atg tgg gac agc gtc ggc agc gac ctg ttt
gly ser ala ser leu val ala ala ala gln met trp asp ser val ala ser asp leu phe
121/41 151/51
tgc gcc ggc tgc ggc ttt cag tgc gtc gcc tgg ggt ctg acg gtc ggc tgc tgc ata ggt
ser ala ala ser ala phe gln ser val val trp gly leu thr val gly ser trp ile gly
181/61 211/71
tgc tgc ggc ggt ctg arg gtc ggc gcc gcc tgc cgc tat gtc ggc tgc atg agc gcc acc
ser ser ala gly leu met val ala 211/71
ala ala ser pro tyr val ala trp met ser val thr 241/91
241/91 271/91
ggc ggc cgc gcc gag ctg acc gcc gcc cag gtc ggc gtc ggc ggc ggc tac gag acc
ala gly gln ala glu leu thr ala ala gln val arg val ala ala ala tyr glu thr
301/101 331/111
ggc tat ggc ctg acg gtc gcc gcc gcc gtc atc gcc gag aac cgt ggt gaa ctg arg ata
ala tyr gly leu thr val pro pro pro val lle ala glu asn arg ala glu leu met lle
361/121 391/131
ctg atc ggc acc aac ctg ttc ggc cca aac acc ccc ggc acc gcc gtc aac gag gcc gaa
leu ala ala thr asu leu leu gly gln asn thr pro ala ile ala val asn glu ala glu
421/141 451/151
tgc ggc gag atg tgc gcc cca gac gcc gcc ggc arg ttt ggc tac gcc ggc ggc arg ggc
tyr gly glu met trp ala gln asp ala ala ala met phe gly tyr ala ala ala thr ala
481/161 511/171
acc ggc acc ggc acc ttc ctg gcc ttc gag gag ggc cgc gag atg acc acc ggc ggt ggc
thr ala thr gly ser leu leu pro phe glu glu ala pro glu met thr ser ala gly thr
541/181 571/191
ctc gcc gag cag gcc gcc ggc gtc gag gag gcc tcc gcc acc gcc ggc ggc acc cag ttc
leu leu glu gln ala ala ala val glu glu ala ser asp thr ala ala ala asn gln leu
601/201 631/211
atg aac aat gtc gcc cag ggc ctg cca aag ctg gcc cag gcc acc gag ggc acc arg cct
met asn asn val pro gln ala leu gln gln leu ala gln pro thr gln gly thr thr pro
661/221 691/231
tcc tcc aag ctg ggt ggc ctg tgg aag acc gcc tgc cgc gat cgc tgc cgc atc acc aac
ser ser lys leu gly gly leu trp lys thr val ser pro his arg ser pro ile ser asn
721/241 751/251
atg gtc tgc atg gcc aac aac ccc atg tgc atg acc acc tgc ggt gtc tgc atg acc aac
met val ser met ala asn asn his met ser met thr asn ser gly val ser met thr asn
781/261 811/271
acc ctg agc tgc atg ttc aag ggc ttt gct cgc gcc ggc gcc gcc gcc gtc cca acc
thr leu ser ser met leu lys gly phe ala pro ala ala ala ala gln ala val gln thr
841/281 871/291
ggc ggc cca aac ggc gtc cgc gcc atg acc tgc ctg ggc acc tgc ggt tcc tgc ggt
ala ala gln asn gly val arg ala met ser ser leu gly ser ser leu gly ser ser gly
901/301 931/311
ctg gcc ggt ggc ctg gcc gcc aac ttc ggt cgc gcc gcc tgc gag gtc ggc tgc tgc gtc
leu gly gly gly val ala ala asn leu gly arg ala ala ser val gly ser leu ser val
961/321 991/331
tgc aag gcc tgc gcc gcc gcc aac cag gcc gcc acc cgc gcc ggc ggc ggc ctg cgc ctg
pro gln ala trp ala ala ala asn gln ala val thr pro ala ala arg ala leu pro leu
1021/341 1051/351
acc ggt ctg acc acc gcc gcc gaa aga ggc acc ggc cag acc ctg ggc ggc ctg cgc gtc
thr ser leu thr ser ala ala gln arg gly pro gly gln met leu gly gly leu pro val
1081/361 1111/371
ggc aag atg gcc gcc acc gcc ggt ggt ggc ctg acc ggt ggc ctg cgc ggt acc gcc cgc
gly gln met gly ala arg ala gly gly gly leu ser gly val leu arg val pro pro arg
1141/381 1171/391
acc tat ggc atg acc tat tat ccc gcc gcc gcc cag
pro tyr val met pro his ser pro ala ala gly aac

SEQ ID N° 5R

FIGURE 5R
FEUILLE DE REMPLACEMENT (REGLE 26)

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Seq SP: ORF d'après Cole et al. (Nature 393:537-544) et contenant la séquence Rv1196

1/1 31/11
 tag gga cac gta atg gtg gat ttc ggg ggc tra cca cag gag atc aac tcc ggg agg atg
 AMB gly his val met val asp phe gly ala leu pro pro glu ala asn ser ala arg met
 61/21 91/31
 tag gcc ggc cag ggt tag gcc tgg ctg gtg gcc ggg gct tag atg tgg gac ago gtg ggc
 tyr ala gly pro gly ser ala ser leu val ala ala ala ala ala ala ala ala ala ala
 121/41 161/51
 agt gac ctg ttt tgg gcc ggc tgg ggc ttt cag tgg gtc gtc tgg ggt ctg aag gtg ggg
 ser asp leu phe ser ala ala ser ala phe gin ser val val trp gly leu thr val gly
 181/61 221/71
 tag tgg ata ggt tgg tgg ggc ggt ctg atg gtg ggg gcc gcc tgg cag tar gtg ggc tgg
 ser trp ile gly pro gly ser ala gly leu met val ala ala ala ala ala ala ala ala ala
 241/81 271/91
 atg agc gtc acc gcc ggg cag gcc gag ctg acc gcc gcc cag gtc cgg gtt ggt ggc gcc
 met ser val thr ala gly gin ala glu leu thr ala ala ala ala ala ala ala ala ala
 301/101 331/111
 gcc taa gag acc ggc tat ggg ctg acc gtc gcc cag cag cag gtc acc gcc gag aac cgt gct
 ala tyr ala gly pro gly ser gly leu thr val pro pro pro val ile ala glu asn arg ala
 361/121 391/131
 gaa ctg atg att ctg ata gcc acc aac ctc ttg ggg caa acc acc cgg ggg atc ggc gtc
 glu leu met ile leu ile ala thr asn leu leu gly gin asn thr pro ala ile ala val
 421/141 451/151
 aac gag gcc gaa cac gcc gag atg tgg gcc caa gag gcc gcc ggc atg ttt ggc tac gcc
 asn glu ala glu tyr gly gly met trp ala gin asp ala ala ala met phe gly tyr ala
 481/161 511/171
 ggc ggc acc gcc agc ggc agc ggc acc tgg ctg cag gtc ttc gag gag gcc cgg gag atg acc
 ala ala thr ala thr ala thr ala thr leu leu pro phe glu glu ala pro glu met thr
 541/181 571/191
 agc ggc ggt ggc ctg ctc gcc gag gcc gcc gcc ggc gtc gag gag gcc tcc gag acc gcc ggc
 ser ala gly gly leu leu leu glu gin ala ala ala val glu ala ala ala ala ala ala
 601/201 631/211
 gcc aac cag ttg atg aac aat gtg ccc gag gcc ctg caa cag ctg gcc nag ccc acc gcc
 ala asn gin leu met asn asn val pro gin ala leu gin gin leu ala gin pro thr gin
 661/221 691/231
 ggc acc acc cct tct tcc aag ctg ggt ggc ctg tgg aag acc gtc tgg cgg cat cgg tgg
 gly thr thr pro ser ser lys leu gly gly leu trp lys thr val ser pro his arg ser
 721/241 751/251
 cgg atc agc aac atg gtg tgg atg gcc aac aac cag atg tgg atg acc aac tgg ggt gtc
 pro ile ser asn met val ser met ala asn asn his met ser met thr asn ser gly val
 781/261 811/271
 tgg atg acc aac acc ctg agc tgg atg tgg aag gcc ttt gct cgg gcc gcc gcc gcc gcc
 ser met thr asn thr leu ser ser met leu lys gly phe ala pro ala ala ala ala ala
 841/281 871/291
 gcc ctg caa acc gcc gcc caa acc ggg gtc cgg ggc atg agc tgg ctg gcc ago tgg ctg
 ala val gin thr ala ala gin asn gly val arg ala met ser ser leu gly ser ser leu
 901/301 931/311
 ggt tct tgg ggt ctg gcc ggt ggg gtc gcc gcc aac tgg ggt cgg gcc gcc tgg tct ggt
 gly ser ser gly leu gly gly gly val ala ala asn leu gly arg ala ala ala ser val gly
 961/321 991/331
 tgg tgg tgg gtc cag aag gcc tgg gcc gcc gcc aac cag gca gtc acc cgg gcc gcc gcc
 ser leu ser val pro gin ala trp ala ala ala asn gin ala val thr pro ala ala arg
 1021/341 1051/351
 gcc ctg cgg cgg acc agc ctg acc agt gcc gcc caa aac agc ggg acc gcc agc atg ctg gcc
 ala leu pro leu thr ser leu thr ser ala ala ala arg gly pro gly gin met leu gly
 1081/361 1111/371
 ggg ctg cgg ggc ggc aag atg gcc gcc agc gcc ggt ggt ggt acc agt ggt gtc ctg ggt
 gly leu pro val gly gin met gly ala arg ala gly gly gly leu ser gly val leu arg
 1141/381 1171/391
 gtr cgg cgg cca ccc tat gtg atg tgg ccc tct cgg gcc gcc ggt tag
 val pro pro arg pro tyr val met pro his ser pro ala ala gly AMB

SEQ ID N° SP

FEUILLE DE REMPLACEMENT (REGLE 26)

19/185

31/11
 GGA TCC TGA TCC AAG TGG TCC GGG ATT TGT CGG CAG CCA CGG CGG TCC CGT CGA CCA ACG
 gly ser OFA cys lys trp ser gly ile cys arg gln pro arg arg ser arg arg pro thr
 61/21
 TTG GTG CAT CGG GGC TGC GAG CAT GCA CGC ACC GAC CAG CTC GGC GAG CGC GGC TAG CTC
 leu val his pro gly cys glu his ala arg thr asp gln arg gly glu arg gly AMB leu
 121/41
 CTT GCC CAC TGT TCC TCC CTG CCG GCA CCA TGT GCG ACA AAG TTA AGC GCA GCA GTA CGC
 leu ala his cys ser ser leu pro ala pro cys ala thr ser leu ser ala ala val pro
 181/61
 GCG GTG CCT GGG CAT CCA GCA AAA CGG GCA GGT CAA GAA CGA TTC ATG AAC GAG GGG TCG
 ala val pro gly his pro ala lys arg gly ala gln glu arg phe met asn glu gly sec
 241/81
 TCA CCA ACG TCG AAA CCG ACG GTT GCG ACG CGG CCC ACG AKA TTT CGT GGT CGA GGG TCC
 ser pro thr ser lys pro thr val ala ser arg pro thr ile leu arg ala arg gly ser
 301/101
 GCT GTA CCC TCA CGG AAC GTG ACT CGC ACA CCG CGG ACG CGG GCG ACT CTG GCG TCG TTA
 ala val pro ser pro asn val ser pro thr pro arg arg arg ala thr leu ala ser leu
 361/121
 GCA GCG GAG CTC AAG GTG TCC CGC ACG ACT GTC TCG AAT GCT TTT AAC CGA CGG GAT CCA
 ala ala gln leu lys val ser arg thr thr val ser asp ala phe asp arg pro asp pro
 421/141
 GAA GGA GAA GAT C
 glu gly glu asp

SEQ ID N° 6A

FIGURE 6A

32/11
 GAT CCT GAT CCA AGT GGT CCG GGA TTT CTC GGC AGC CAC CGC GGT GGC CTC GAC CAA CGT
 asp pro asp ala ser gly pro gly phe val gly ser his gly gly pro val asp gln arg
 52/21
 TGG TCC ATC CGG GGT GCG AGC ATG CAC GCA CGC ACC AGC GCG CGG AGC GCG GCT AGC TCC
 trp cys ile arg ala ala ser met his ala pro thr ser ala ala ser ala ala ser cys
 122/41
 TTG CAC ACT GTT GCT CCC TCC CGG CAC CAT GTG CCA CAA GGT TAA CGC CAG CAG TAC CGC
 leu pro thr val pro pro cys arg his his val arg gln ala CGH ala gln gln Tyr arg
 182/61
 CCG TCC CTG GGC ATC CAG CAA AAC GGG GAG CTC AAG AAC GNT TCA TGA ACG ACG GGT CGT
 arg cys leu gly ile gln gln asn gly gln val lys asp asp OFA thr arg gly arg
 242/81
 CAC CAA CGT CGA AAC CCA CGC TTG CCA GCG GCG CCA CGA TAT TCG GTG CTC GAG GGT CCG
 his gln arg arg asn arg arg leu pro ala gly pro arg cys cys val leu glu gly pro
 302/101
 CTG TAC CCT CAC CGA ACG TGA GTC CCA CAC CGC GGA GCG GCG CGA CTC TGG CGC GGT TAG
 leu tyr pro his arg thr OFA val pro his arg gly gly arg leu trp arg arg AMB
 362/121
 CAG CGG AGC TCA ACG TGT CCC GCA CCA CTG TCT CGA ATG CTT TTA ACG GAC CGG ATC CAG
 gln pro ser ser arg cys pro ala pro leu ser arg met leu leu thr asp arg ile gln
 422/141
 AAG GAG AAG ATC
 lys glu lys ala

SEQ ID N° 6B

20/185

33/11
 ATC CTG ATG CAA GTG GTC CCG GAT TTG TCG GCA GCG ACC GCG GTC CCG TCG ACC AAC GTT
 ile leu met gin val val arg asp leu ser ala ala thr ala val pro ser thr asn val
 63/21
 GGT GCA TCC GGG CTG CCA GCA TGC ACG CAC CCA CCA GCG CCG CCA GCG CTA GGT GGT
 gly ala ser gly leu arg ala cys thr his arg pro ala arg arg ala arg leu ala ala
 123/41
 TGC CCA CTG TTC CTC CCT GGC GGC ACC ATG TGC GAC AAG CTT AAG CAC ACC AGT ACC GGC
 cys pro leu phe leu pro ala gly thr met cys asp lys leu lys arg ser ser thr gly
 183/61
 GGT GCG TGG GCA TCC AGC AAA ACG GCG AGC TCA AGA ACC ATT CAT GAA CCA GCG GTC GTC
 gly ala trp ala ser ser lys thr gly ser ser arg thr ile his glu arg gly val val
 243/81
 ACC AAC GTC GAA ACC GAC GGT TGC CAG CCG GCG CAC GAT ATT GCG TGC TCG AGG GTC GGT
 thr asn val glu thr asp gly cys gin pro ala his asp ile ala cys ser arg val arg
 303/101
 TGT ACC CTC ACC GAA CGT GAG TCC CAC ACC GCG GAG GCG GCG GAC TCT GCG GTC GTT AGC
 cys thr leu thr glu arg glu ser his thr ala glu ala gly asp ser gly val val ser
 363/121
 AGC CCA GGT CAA GGT GTC CCG CAC CAC TGT CTC GAA TGC TTT TAA CCG ACC GGA TCC AGA
 ser arg ala gin gly val pro his his cys leu glu cys phe CCH pro thr gly ser arg
 423/141
 AGG AGA AGA TC
 arg arg arg

SEQ ID N° 6C

FIGURE 6C

31/11
 CCG TCG GCA ACT TGG CCG CTG AGG TCG GGT TGA TCC CTS GCG CGA GCG GCG TCA GCG AAT
 pro ser ala thr trp pro leu arg ser ala CPA ser leu gly arg gly gly ser ala ser
 61/21
 AGC GGC TCC ATC GGC TTT GGT GGT AGC GGT TCC GCG CGA ACC TAG CCG CGA CGT TGT CCG
 ser gly ser ile gly phe ala gly ser gly ser ala gly ser AMB arg arg arg cys arg
 121/41
 TGG CCG GTG ATA TAT TCG GTC AGA CCG GTA TGG CCG CCG CTS AGG TGA TCT GCG ACA CCG
 trp pro val ile tyr trp val arg arg val trp arg arg leu arg CPA ser ala thr arg
 181/61
 CCG CCG GGT GGT CGA GCG AGG CTT AGC ACC AGG GAA TTT CGA AAA TCT TAT TCA GAA CAT
 arg arg gly ala arg ala arg leu thr thr arg glu phe arg lys cys tyr ser glu his
 241/81
 CTT GTA TCT CTT CTC GGT GCG ACC CCG TAG GTC TAG TGT TTT CGA GTA CCG GCA GAT CCG
 leu val ser leu leu arg ala thr pro AMB val AMB cys phe arg val pro ala asp pro
 301/101
 AGG TTC ACC AGG TCT CAC CAG ATC
 arg phe thr arg ser his gin ile

SEQ ID N° 7A

FIGURE 7A

FEUILLE DE REMPLACEMENT (REGLE 26)

21/185

32/11
 CGT CGG CAA GTT GGC CGC TGA GGT CGG CTT GAT CCC TGG GCG GAG GCG GGT CAG CCA ATA
 arg arg gln leu gly arg OFA gly arg leu asp pro trp ala glu ala gly glo pro ile
 62/21
 GCG GCT CCA TCG GCT TTS CTG GTA GCG GTT CGG CGG GAA GGT AGC GGC GAC GTT CTC GGT
 ala ala pro ser ala leu leu val ala val arg arg glu ala ser gly asp val val gly
 122/41
 GGC CGG TCA TAT ATT GGG TCA GAC GGG TAT GGC GCG GCG TGA GGT GAT CTG CGA CAC GCG
 gly arg OFA tyr ile gly ser asp gly tyr gly gly gly OFA gly asp leu arg his ala
 182/61
 GCG GCG GTG CTC GAG CCA GGC TTA CGA CGA GCG AAT TTC GAA AAT GTT ATT CAG AAC ATC
 ala ala val leu glu pro gly leu arg pro gly asn phe glu asn val ile glu asn ile
 242/81
 TTG TAT CTC TTC TCG GTG CCA CCG CCT AGG TGT AAT GTT TTC GAG TAC CGG CAG ATC CCA
 leu tyr leu phe ser val pro pro pro arg cys ser val phe glu tyr arg glu ile pro
 302/101
 GGT TCA CCA GGT CTC ACC AGA TC
 gly ser pro gly leu thr arg

SEQ ID N° 7B

FIGURE 7B

33/11
 GTC GGC AAC TTG GCG GGT GAG GTC GGG TTG ATC COT GGG CGG AGC CGG GTC ACC CAA TAG
 val gly asn leu ala ala glu val gly leu ile pro gly pro arg arg val ser glu AMB
 63/21
 CGG CTC CAT CGG CTT TGC TGG TAG CCG TTC GGC GGG AAG CTA GCG CGG AGC TTG TCG GTG
 arg leu his arg leu cys trp AME arg phe gly gly lys leu ala ala thr leu ser val
 123/41
 GCG GGT GAT ATA TTG GGT CAG ACG GGT ATR GCG GCG GGT GAG GTG ATC TCG GAC ACG CGG
 ala gly asp ile leu gly gln thr gly met ala ala ala glu val ile cys asp thr pro
 183/61
 CCG GGG TGC TCG AGC CAG GCT TAC GAC CAG GGA ATT TCG AAA ATG TTA TTC AGA ACR TCT
 pro arg cys ser ser gln ala tyr asp glu gly ile ser lys met leu phe arg thr ser
 243/81
 TGT ATC TCT TCT CCG TGC CAC CCC CTA GGT GTA GTG TTT TCG AGT ACC GGC AGA TCC CAG
 cys ile ser ser pro cys his pro leu gly val val phe ser ser thr gly arg ser gln
 303/101
 GTT CAC CAG CTC TCA CCA GAT C
 val his gln val ser pro asp

SEQ ID N° 7C

FIGURE 7C

22/185

31/11
 CTT TGC GTG ATG TCC AAT GGC GAA AAC GAC GGC TTG TCA TCG CAA TCG TCA GCA CCG GCG
 leu cys val met ser asp gly glu asn asp ala leu ser ser gln ser ser ala pro ala
 61/21
 TAG TTT TCG CGA TGA CCG TCG TTC TGA CCG GAC TTS TGA ACG GGT TTC CCG TCG AGG CCG
 AMB phe ser arg CPA arg ser phe CPA pro asp leu CPA thr gly phe gly ser arg pro
 121/41
 AGC GAA CCG TCG ATT CCA TGG GTC TCG ACG CAT TCG TCG TCA ACG CCG GCG CCG GAG GAC
 ser glu pro ser ile pro trp val ser thr his ser trp ser arg pro ala arg gln asp
 101/61
 CGT TCC TGG GTT CCA GAC CAT TCG CCG AAA TCG ACC TCG CCG AGG TTG CTC CTC CCG CTC
 arg ser trp val arg his his ser pro lys ser thr cys pro arg leu leu val arg leu
 241/81
 GCG TCT TGG CTG CCG CCG CAC TAG CCA CTG CCG CGT CCA CGA TCC GCG AGG GCA COT CAG
 ala ser trp leu pro pro his AMB arg leu arg arg arg arg ser gly arg ala arg gln
 301/101
 CCG GAA ACG TCA CCG CTT TCG GCG CAC CAG AGC ACG GAC CCG GCA TCG CCG GGG TCT CCG
 arg glu thr ser pro arg ser gly his gln ser thr asp pro ala cys arg gly ser arg
 361/121
 ACG GTC CCG CCG CAT CGA CCG CCG ACG ACG TCG CCG TGT CCA GCA CCG TGG CCG GAA ACG
 thr val gly arg his arg arg arg thr arg ser arg cys arg ala arg trp ala glu thr
 421/141
 TCG GCG ACG ATC
 ser ala thr ile

SEQ ID N° 8A

FIGURE 8A

32/11
 FTT GCG TGA TGT CCA ATG GCG AAA ACG ACG CTT TGT CAT CCG AAT GGT CAG CAC CCG CTT
 phe ala CPA cys pro met ala lys thr thr pro cys his arg asp arg gln his arg pro
 52/21
 AGT TTT CCG GAT GAC GGT COT TGT GAC CCG ACT TGT GAA CCG GTT TCG GGT CCA GCG CGA
 ser phe arg asp asp ala arg ser asp arg thr cys glu arg val ser gly arg gly arg
 122/41
 CCG AAC CGT CGA TTC CAT GGG TGT CCA CCG ATT CTT GGT CAA GCG CCG CCG GCG ACG ACG
 ala asn arg arg phe his gly cys arg arg ile arg gly gln gly arg arg gly arg thr
 182/61
 GTT CCT GGG TTC GAC ACC ATT CCG CCA AAT CGA COT GCG CCA GGT TCG TCG TCG GCG TCG
 val pro gly phe asp thr ile arg pro asn arg pro ala pro gly cys ser cys ala trp
 242/81
 CGT CTT GCG TGG CCG CCC ACT AGC GAC TGC GCG CTC GAC GAT CCG GCA GGG CAC GTC AGC
 arg leu gly cys arg pro thr ser asp cys ala val asp asp pro ala gly his val ser
 302/101
 CCG AAA COT CAG CCG GTT CCG GCG ACC AGA CCA CCG ACC CCG CAT GCG CCG GGT CTC GAA
 ala lys arg his arg val arg gly thr arg ala arg thr arg his ala ala gly leu gly
 362/121
 CCG TCG GCG CCG ATC GAC CCG GCA GGT GCG GGT GTC GAG CAG GGT GCG CCG AAA COT
 arg ser gly ala ile asp ala gly arg gly arg gly val glu his ala gly pro lys pro
 422/141
 CCG CCA CGA TC
 arg arg asp

SEQ ID N° 8B

FEUILLE DE REMPLACEMENT (REGLE 26)

23/185

33/11
 TTG CGT GAT GTC CAA TGG CGA AAA CGA GGC CTT GTC ATC GCA ATC GTC AGC ACC GGC CTA
 leu arg asp val gln trp arg lys arg arg leu val ile ala ile val ser thr gly leu
 63/21
 GTT TTC GCG ATG ACG CTC GTT CTG ACG GGA CTT GTC AAC GGG TTT CCG GTC GAG GGC GAG
 val phe ala met thr leu val leu thr gly leu val asn gly phe arg val glu ala glu
 123/41
 CGA ACC GTC GAT TCG ATG GGT GTC GAC GCA TTC GTG GTC AAG GCG GCG GCG GCA GGA CCG
 arg thr val asp ser met gly val asp ala phe val val lys ala gly ala ala gly pro
 183/61
 TTC CTG GGT TCG ACA CCA TTC GGC CAA ATC GAC CTG CCG CAG GTT GCT CGT GCG CCT GCG
 phe leu gly ser thr pro phe ala gln ile asp leu pro gln val ala arg ala pro gly
 243/81
 GTC TTG GCT GCG GCG CCA GTA GCG ACT GCG CCG TCG ACG ATC CCG CAG GCG ACG TCA GCG
 val leu ala ala ala pro leu ala thr ala pro ser thr ile arg gln gly thr ser ala
 303/101
 CGA AAC GTC ACC GCG TTC GGG GCA CCA GAG CAC GGA CCG GGC ATG CCG GCG GTC TCG GAC
 arg asn val thr ala phe gly ala pro glu his gly pro gly met pro arg val ser asp
 363/121
 GGT CCG GCG CCA TCG ACG CCG GAC GAG GTC CCG GTG TCG ACC ACG CTG GCG CCA AAC CTC
 gly arg ala pro ser thr pro asp glu val ala val ser ser thr leu gly arg asn leu
 423/141
 GGC GAC GAT C
 gly asp asp

SEQ ID N° 8C

FIGURE 8C

partie de la séquence nucléotidique de seq8A

1/1
 CAG GTT GGT CGT GCG CTT GGC GTC TTG GCT GCG GCG CCA CTA GCG ACT GCG CCG TCG ACG
 gln val ala arg ala pro gly val leu ala ala ala pro leu ala thr ala pro ser thr
 61/21
 ATC CCG CAG GCG ACG TCA GCG CCA AAC GTC ACC GCG TTC GGG GCA CCA GAG CAC GGA CCG
 ile arg gln gly thr ser ala arg asn val thr ala phe gly ala pro glu his gly pro
 121/41
 GGC ATG CCG CCG GTC TCG GAC GGT CCG GCG CCA TCG ACG GCG GAC GAG GTC GCG GTG TCG
 gly met pro arg val ser asp gly arg ala pro ser thr pro asp glu val ala val ser
 181/61
 ACC ACG CTG GCG CCA AAC CTC GCG GAC GAT C
 ser thr leu gly arg asn leu gly asp asp

SEQ ID N° 8A'

FIGURE 8A'

24/195

1/1 31/11
 AGG TTG GTG GTG CGC CTG GCG TCT TGG CTG CCG CCC CAC TAG CGA CTS CCG CGT CGA CGA
 arg leu leu val arg leu ala ser trp leu pro pro his AME arg leu arg arg arg arg
 61/21 91/31
 TCC GGC AGG GCA CGT CAG CGC GAA ACG TCA CCG CGT CCG GCG CAC CAG AGC ACC GAC CCG
 ser gly arg ala arg gln arg glu thr ser pro arg ser gly his gln ser thr asp pro
 121/41 151/51
 GCA TGC CCG GGG TCT CGG ACG CTC GGG CGC CAT CGA CCG CCG ACG AGG TCG CCG TGT CGA
 ala cys arg gly ser arg thr val gly arg his arg arg arg thr arg ser arg cys arg
 181/61
 GCA CGC TGG GCG GAA ACC TCG GCG ACG ATC
 ala arg trp ala glu thr ser ala thr ile

SEQ ID N° 8B'

FIGURE 8B'

Seq8C

1/1 31/11
 CGA GGT TGG TCG TCG GCG TGG CGT CTT GGC TGG CCG CCC ACT ACC GAC TGC GCG GTC GAC
 pro gly cys ser cys ala trp arg leu gly cys arg pro thr ser asp cys ala val asp
 61/21 91/31
 GAT CCG GCA GCG CAC GTC AGC CGG AAA CCG CAC CCG GTT CCG TCG ACC AGA GCA CCG ACC
 asp pro ala gly his val ser ala lys arg his arg val arg gly thr arg ala arg thr
 121/41 151/51
 CGG CAT GCG GCG GGT CTC GGA CCG TCG GCG GCG ATC GAC GCT GGA CCG GGT CCG GGT GTC
 arg his ala ala gly leu gly arg ser gly ala ala asp ala gly arg gly arg gly val
 181/61
 CAG CAC GGT GCG CCG AAA CCG CCG CGA CGA TC
 glu his ala gly pro lys pro arg arg arg

SEQ ID N° 8C'

FIGURE 8C'

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séquence Rv2563 prédite par Cole et al. (Nature 393:537-544) et contenant seqSA'

atg
met
121/41 181/51
ctt ttc ggc gct tgg agt gat gtc caa agy gga aaa cga gga ott gtc atc gaa acc gtc
leu phe ala ala leu arg asp val gln trp arg lys arg arg leu val ile ala ile val
181/61 211/71
agc acc ggc cca gtt ttc gag atg acc ctc gtt ctg acc gga ott gtc acc ggg ttc cgg
ser thr gly leu val phe ala met thr leu val leu thr gly leu val asn gly phe arg
241/81 271/91
gtc gag gcc gag cga acc gtc gat toc atg ggt gtc gac gaa ttc gtc gtc acc gcc gcc
val glu ala glu arg thr val asp ser met gly val asp ala phe val val lys ala gly
301/101 331/111
ggc gca gga acc ttc ctg ggt tog aca cca ttc gcc cca atc gac atg acc gag gtt gct
ala ala gly pro phe leu gly ser thr pro phe ala gln ile asp leu pro gln val ala
361/121 391/131
cgt gag cct ggc gtc tgg gct gcc gcc cca cta ggc act ggc cgg tog acc atc cgg gag
arg ala pro gly val leu ala ala ala pro leu ala thr ala pro ser thr ile arg gln
421/141 451/151
ggc acc tca ggc cga aac gtc acc ggc ttc ggg gca cca gac acc gaa gcc atg acc
gly thr ser ala arg asn val thr ala phe gly ala pro glu his gly pro gly met pro
481/161 511/171
cgg gtc tgg gac ggt cgg gcc cca cgg acc cgg gac gag gtc gag gtc tog acc acc ctg
arg val ser asp gly arg ala pro ser thr pro asp glu val ala val ser ser thr leu
541/181 571/191
ggc cga aac ctc ggc gac gat ctg caa gtc ggt ggc cgc acc ttg agt atc gtc gcc atc
gly arg asn leu gly asp asp leu gln val gly ala arg thr leu arg ile val gly ile
601/201 631/211
ggc acc gag tca acc ggc ctg gca aag att ccc aac atc ttc ctg acc acc gaa gcc cta
val pro glu ser thr ala leu ala lys ile pro asn ile phe leu thr thr glu gly leu
661/221 691/231
cag cag tgg gca tac aac gga cag cgg aca acc gtt tog atc ggg atc gac ggc arg ccc
gln gla leu ala tyr asn gly gln pro thr ile ser ser ile gly ile asp gly met pro
721/241 751/251
cga cag ctg acc gac gcc tat cag acc gtc aat cga gag gac gct gtc acc gat ctg atg
arg gla leu pro asp gly tyr gln thr val asn arg ala asp ala val ser asp leu met
781/261 811/271
gac cgg ttg aag gcc ggc gtc gat ggc atc acc gtt gta gcc gtc ttg ctg acc atc gtt
arg pro leu lys val ala val asp ala ile thr val val ala val leu leu trp ile val
841/281 871/291
ggc acc tgg atc gtc gcc tog gtc gtc lac ctc ttr gag ttg gag cgg ctg acc gac ttt
ala ala leu ala val gly ser val val tyr leu ser ala leu glu arg leu arg asp phe
901/301 931/311
ggc gtc ttc acc gag atc ggc gtc cgg acc cgc tog att ctg gcc gag ctg gcc ctg gag
ala val phe lys ala ile gly val pro thr arg ser ile leu ala gly leu ala leu gln
961/321 991/331
ggc gtc gtc gtc ggc ctg ctc gcc gcc gtc gtt gcc ggc acc ctc tcc ctg ctg ttg ggc
ala val val val ala leu leu ala ala val val gly gly ile leu ser leu leu leu ala
1021/341 1051/351
cgg tgg ttc cgg atg acc gac gtc gta ccc ctg acc gcc ttc ctg gcc acc cgg gag atc
pro leu phe pro met thr val val val pro leu ser ala phe val ala leu pro ala ile
1081/361 1111/371
ggc acc gtc atc ggt ctg ctg gcc acc gtc gca gga ctg cgg acc gtc gtc gcc acc gat
ala thr val ile gly leu leu ala ser val ala gly leu arg val val ala ile asp
1141/381
cgg gca cga ggc ttc gga ggt acc tog
pro ala leu ala phe gly gly pro AMB

SEQ ID N° 80

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ORF prédite par Cole et al. (Nature 393:537-544) et contenant Rv2563

1/1 31/11
 tag gtt tea aga agg cct gtg cag gtt tcc gca gcc tgg gcc gog gog cca cag aag agc
 AMS val ser arg arg pro val gln val ser ala ala trp ala ala ala pro pro lys ser
 61/21 91/31
 cag cag asa tgg gtt aat cgg gtt cgc tgg gct cga tgg cag atg ate tgg aac gca cag
 pro pro lys trp ala asn arg val arg leu ala arg ser pro met ala ser thr ala thr
 121/41 151/51
 acc gaa ccc ctc acc tgg gtc gaa cct cgg cga acc aac ggg gca acc cca gcc cat gat
 thr asp asp pro leu thr ser val glu pro arg arg thr asn ala ala thr pro ala his asp
 181/61 211/71
 cat tgg att ggg tcc acg gaa gca ggt agc ttc cgt cgc acg ctt ttt gog gct tgg cgt
 his leu ile gyl ser thr glu ala gly ser phe arg arg met leu phe ala ala thr arg
 241/81 271/91
 gat gtc cca tgg cga asa cga cgc ctt gtc atc gca atc gtc acc acc ggc cta gtt tcc
 asp val gln trp arg lys arg arg leu val ile ala ile val ser thr gly leu val phe
 301/101 331/111
 cag atg acg ctc gtt ctg acc gga ctt ggg aac ggg ttt agt gtc gag gcc gag gga acc
 ala met thr leu val leu thr gly leu val asn gly phe arg val glu ala glu arg thr
 361/121 391/131
 gtc gat tcc atg ggt gtc gac gca ttc gtc gac aag gcc ggc ggc gca gga cag ttc ctc
 val asp val ser met gly val asp ala phe val val lys ala gly ala ala gly pro phe leu
 421/141 451/151
 cgt tgg asa cca phe gcc asa atc gac ctc ccc cag gtt gct cgt ggc ctt ggc ttc tgg
 gly ser thr pro phe ala gln ile asp leu pro gln val ala arg ala pro gly val leu
 481/161 511/171
 gct ggc gcc cca cta ggc act ggc cgg tgg acg acc cgg cag ggt acc tea ggc cga acc
 ala ala ala pro leu ala thr ala pro ser thr ala arg gln gly thr ser ala arg asn
 541/181 571/191
 gcc acc gog ttc ggg gca cca gag cac gga ccc ggc atg cag ggg gtc tcy gac ggt cgg
 val thr ala phe gly ala pro glu his gly pro gly met pro arg val ser asp gly thr
 601/201 631/211
 ggc cca tgg acg cgg gac gag gtc gog gtc gtc cag acg cgt ggt cga acc ctc ggc gac
 ala pro ser thr pro asp glu val ala val ser ser thr leu gly arg asn leu gly asp
 661/221 691/231
 cgt cag cca gty ggt gog cgc act tgg cgg ate gtc ggc atc gtc ccc gag tca acc ggc
 asp leu gln val gly ala arg thr leu arg ile val gly ile val pro glu ser thr ala
 721/241 751/251
 tgg gca aag att ccc aac atc ttc ctc acc acc gsa gcc cta cag cag tgg gca taa aac
 leu ala lys ile pro asn ile phe leu thr thr glu gly leu gln gln leu ala tyr asn
 781/261 811/271
 gga cag cag asa atc agt tgg atc ggg atc gac ggg atg acc cga cag gtc cag gac ggc
 gly gln pro thr ile ser ser ile gly ile asp gly met pro arg gln leu pro asp gly
 841/281 871/291
 tat cag acc gto aat cga gog gat gct gtc acc gat atg arg cgc cgc tgg aag gto gog
 tyr gln thr val asn arg ala asp ala val ser asp leu met arg pro leu lys val ala
 901/301 931/311
 gtc gat gog atc acg gtr gtc ggc gtc tgg ctc tgg atc gtt gog ggc tgg atc gtc ggc
 val asp ala phe thr val ala val ala val leu thr phe ala val ala leu ile val gly
 961/321 991/331
 tgg gtg gtc lea ctc tcc gog tgg gaa cgg ctc cgt gac ttc ggc ggc atc aag gog atc
 ser val val tyr leu ser ala leu glu arg leu arg asp phe ala val phe lys ala ile
 1021/341 1051/351
 ggc gtc cag acc ggc tgg att ctc ggc ggg ctc ggc ctc gag ggc gtc gtc gtc ggc ctc
 gly val pro thr arg arg ser ile leu ala gly leu ala leu gln ala val val val ala leu
 1081/361 1111/371
 ctc gog gog gtc gtt ggc gcc atc ctt tcc ctc ctc tgg ggc cgc tgg ttc ctc atg acc
 leu ala ala val val gly gly ile leu ser leu leu leu ala pro leu phe pro met thr
 1141/381 1171/391
 gtc gtc gca ccc ctc agt gcc ttc gtc ggc cta tgg ggc atc ggc acc ggc atc ggt ctc
 val val val pro leu leu ser ala phe val ala leu pro ala ile ala thr val ile gly leu
 1201/401 1231/411
 ctc gac acc gtc gca gca ctc cgg cgc gtc ggc ggc acc gat cgc gca cta ggc ttc ggc
 leu ala ser val ala gly leu arg arg val val ala ile asp pro ala leu ala phe gly
 1261/421
 ggt acc tag
 gly acc AMS

SEQ ID N° BF

FEUILLE DE REMPLACEMENT (REGLE 26)

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séquence de Rv0072 prédite par par Cole et al. (Nature 393:537-544) et
présentant plus de 77% de similarité avec Seq8D'

1/1 31/11
atg ctc ttc gcg gcc ctg cgt gac atg caa tgg aga aag cgc cgt ctg gtc atc acg atc
Met leu phe ala ala leu arg asp met gln trp arg lys arg arg leu val ile thr ile
61/21 91/31
atc agc acc ggg ctg atc ttc ggg atg aag ctt gtc tgg acc gga atc gcg aac ggc ttc
ile ser thr gly leu ile phe gly met thr leu val leu thr gly leu ala asn gly phe
121/41 151/51
cgg gtg gag gcc cgg cac acc gtc gat tcc atg ggt gtc gat gta ttc gtc gtc aga tcc
arg val glu ala arg his thr val asp ser met gly val asp val phe val val arg ser
181/61 211/71
ggc gct gct gga ctt ttt ctg ggt tca ata cag ttt ccc gat gtt gac ctg gcc cga gtg
gly ala ala gly pro phe leu gly ser ile pro phe pro asp val asp leu ala arg val
241/81 271/91
gcc gat gaa ccc ggt gtc atg gcc gcg gcc cgg ttg ggc agc gtg ggg acg atc atg aaa
ala ala glu pro gly val met ala ala ala pro leu gly ser val gly thr ile met lys
301/101 331/111
gaa ggc acg tcg cga cga aac gtc acg gtc ttc ggc gcg ccc gag cac gga cct ggc atg
glu gly thr ser thr arg asn val thr val phe gly ala pro glu his gly pro gly met
361/121 391/131
cca cgg gtc tca gag ggt cgg tca cgg tcg aaa cgg gac gaa gtc gcg gca tgg agc aag
pro arg val ser glu gly arg ser pro ser lys pro asp glu val ala ala ser ser thr
421/141 451/151
atg ggc cga cac ctc ggt gac act gtc gag gtc ggc ggc agc aga ttg cgg gtc gtt ggc
met gly arg his leu gly asp thr val glu val gly ala arg arg leu arg val val gly
481/161 511/171
att gtc cag aat tcc acc gng ctg gcc aag atc ccc aat gtc ttc ctg aag acc gag gcc
ile val pro asn ser thr ala leu ala lys ile pro asn val phe leu thr thr glu gly
541/181 571/191
tta cag aac ttg cgc tac aac ggg cag cgg aat atc aag tcc atc ggg atc ata gct arg
leu gln lys leu ala tyr asn gly gla pro asn ile thr ser ile gly ile ile gly met
601/201 631/211
ccc cga cag ctg cgg gag ggt tac cag act ttc gat cgg gtg ggc gct gtc aat gat ttg
pro arg gln leu pro glu gly tyr gln thr phe asp arg val gly ala val asn asp leu
661/221 691/231
gtg cgc cca tcg aag gtc gca gtg aat tcg atc tgg atc gtc gct gtc tcg ctg tgg att
val arg pro leu lys val ala val asn ser ile ser ile val ala val leu leu trp ile
721/241 751/251
gtg cgg gtg ctg atc gtc ggc tcg gtg gtc tac ctt tcg gct ctt gag cgg cta cgt gac
val ala val leu ile val gly ser val val tyr leu ser ala leu glu arg leu arg asp
781/261 811/271
ttc ggg gtg ttc aag ggg att ggc acg cca aag cgc tcg att atg gcc ggg ctc gca tta
phe ala val phe lys ala ala gly thr pro thr arg ser ile met ala gly leu ala leu
841/281 871/291
cag ggc ctg gtc att cga ttg ctc ggc ggc gtc gtc ggc gtc gtc ctg ggc cag gty tgg
gic ala leu val ile ala leu leu ala ala val val gly val val leu ala ala gla val leu
901/301 931/311
gac cca ctg ttt cgg atg att gtc ggc gla ccc gtc ggt gct tac ctg ggc cta cgg gty
ala pro leu phe pro met ile val ala val pro val gly ala tyr leu ala leu pro val
961/321 991/331
gcc ggg atc gtc atc ggt ctg ttc gct agt gtt ggc ggc ttg aag cgc gtc gtc aag gtc
ala ala ile val ile gly leu phe ala ser val ala gly leu lys arg val val thr val
1021/341
gat ccc ggc cag ggc ttc gga ggt ccc tag
asp pro ala gln ala phe gly gly pro AMS

SEQ ID N° 8G

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seq88H : ORF prédite par Cole et al. (Nature 393:537-544) et contenant seq8G
 1/1 31/11
 tag cct ctg gga arg cca ttc gcy gcc ctg cgt gac atg aag aga aag cgc cgc ctg
 AMB pro leu gly met leu phe ala ala leu arg asp met gln trp arg lys arg arg leu
 61/21 51/31
 gtc atc aag atc atc agc acc ggg ctg atc ttc ggc atg acg ctt gtr ctg acc gga ctc
 val ile thr ile ile ser thr gly leu ile phe gly met thr leu val leu thr gly leu
 121/41 151/51
 ggc aac gcc ttc cgg ctg gag gcc cgg cac acc gtc gat tcc atg ggt gtc gat gta ttc
 ala asn gly phe arg val glu ala ala arg his thr val asp ser met gly val asp val phe
 181/61 211/71
 gtc gtc aga tcc gcc gct gct gga cct ttc ctg ggt tca ata cgc ttt ccc gat gtt gac
 val val arg ser gly ala ala gly pro phe leu gly ser ile pro phe pro asp val asp
 241/81 271/91
 ctg gcc cga ggc gcc gct gaa ccc ggt gtc atg gcc ggc gcc cgc ttg gcc agc gtc ggc
 leu ala arg val ala ala glu pro gly val met ala ala pro leu gly ser val gly
 301/101 331/111
 acg atc atg aia gaa ggc acg ctg acg aga aar gtc acg gtc ttc gcc gca ccc gag cac
 thr ile met lys glu gly thr ser thr arg asn val thr val phe gly ala pro glu his
 361/121 391/131
 gga cct gcc atg cca cgg gtc tca gag ggt cgc tca acg tgc aya cgc gac gaa gtc gag
 gly pro gly met pro arg val ser glu gly arg ser pro ser lys pro asp glu val ala
 421/141 451/151
 gca tgc agc acg atg gcc cga cac ctc ggt gac acc gtc gag gtc gcc ggc cgc aga ttc
 ala ser ser thr met gly arg his leu gly asp thr val glu val gly ala arg arg leu
 481/161 511/171
 cgg gtc gtt gcc att gtc cgg aat tcc acc ggc ctg gcc aag atc ccc aat gtc ttc ctc
 arg val val gly ile val pro asn ser thr ala leu ala lys ile pro asn val phe leu
 541/181 571/191
 acg acc gag gcc tta cag aaa ttc ggc tcc aac ggc gag ccy aac atc aag tcc atc ggc
 thr thr glu gly leu gln lys leu ala tyr asn gly gln pro asn ile thr ser ile gly
 601/201 631/211
 atc ata ggt atg ccc cga tag ctg cgc gag ggt tcc tag acc ttc gat cgg gag gcc gct
 ile ile gly met pro arg gln leu pro glu gly tyr gln thr phe asp arg val gly ala
 661/221 691/231
 gtc aet gat tgg gtc cgc cca ttg aag gtc gta ggc aat tgc atc tgc atc gtc gct gtt
 val asn asp leu val arg pro leu lys val ala val asn ser ile ser ile val ala val
 721/241 751/251
 ttc cgc tgg att gtc ggc gtc ctg atc gtc gcc tgg tgc gtc tcc att tgc gct att gag
 leu leu trp ile val ala val leu ile val gly ser val val tyr leu ser ala leu glu
 781/261 811/271
 cgc ata cgt gac ttc gag gtc ttc aag gcc att gcc acg cca acc cgc tcy att atg gct
 arg leu arg asp phe ala val phe lys ala ile gly thr pro thr arg ser ile met ala
 841/281 871/291
 ggc ctc gaa tta cag gcc ctg gac att ggc ttg ctt ggc gcc gtc gtc gcc gtc gtc ctg
 gly leu ala leu gln ala leu val ile ala leu leu ala ala val val gly val val leu
 901/301 931/311
 ggc cag gtc ttg gca cca ctg ttc cgc atg att gtc ggc gta ccc gln ggt gct tcc cgc
 ala gln val leu ala pro leu phe pro met ile val ala val pro val gly ala tyr leu
 961/321 991/331
 ggc ata cgc gcc gcc ggc atc gtc atc cgt ctg ttc gct aac gtt gcc ggc ttg aag cgc
 ala leu pro val ala ala ile val ile gly leu phe ala ser val ala gly leu lys arg
 1021/341 1051/351
 gtc gtc acg gtc gat ccc ggc cag gcy ttc gga ggc ccc tag
 val val thr val asp pro ala gln ala phe gly gly pro AMB

SEQ ID N° 8H

29/185

31/11
 CGA GGC CGA GCG AAC CGT CGA TTC CAT GGG TGT CGA CCG ATT CGT GGT CAA GGC GGG CGC
 arg gly arg ala asn arg arg phe his gly cys arg arg ile arg gly gln gly arg arg
 61/21 91/31
 GGC AGG ACC GTT CCT CGG TTC GAC ACC ATT CCG CCA AAT CGA CTT GGC CCA GGT TGC TCG
 gly arg thr val pro gly phe asp thr ile arg pro asn arg pro ala pro gly cys ser
 121/41 151/51
 TGC GGC TGG CGT CTT GGC TGC CCG CCC ACT AGC GAC TGC GGC GTC GAC GAT CCG CCA GGC
 cys ala trp arg leu gly cys arg pro thr ser asp cys ala val asp asp pro ala gly
 181/61 211/71
 CAC GTC AGC GCG AAA CGT CAC CGC GTT CCG GGC ACC AGA GCA CCG ACC CCG CAT GCG CCG
 his val ser ala lys arg his arg val arg gly thr arg ala arg thr arg his ala ala
 241/81 271/91
 GGT CTC GGA CCG TCG GGC GGC ATC GAC GGC GGA CGA GGT CCG GGT GTC GAG CAC GGT GGC
 gly leu gly arg ser gly ala ile asp ala gly arg gly arg gly val glu his ala gly
 301/101
 CCG AAA GGT CCG CGA CGA TC
 pro lys pro arg arg arg

SEQ ID N° 9A

FIGURE 9A

32/11
 GAG GGC GAG CGA ACC GTC GAT TCC ATG GGT GTC GAC GCA TTC GTC GTC AAG GGC GGC GGC
 glu ala glu arg thr val asp ser met gly val asp ala phe val val lys ala gly ala
 62/21 92/31
 GCA GGA CCG TTC CTG GGT TCG ACA CCA TTC GGC CAA ATC GAC CTG CCG GAG GTT GGT CGT
 ala gly pro phe leu gly ser thr pro phe ala gln ile asp leu pro glu val ala arg
 122/41 152/51
 GCG CCT GGC GTC TTG CCG GGC GGC CCA CTA GCG ACT GCG CCG TCG AGC ATC CCG GAG GGC
 ala pro gly val leu ala ala ala pro leu ala thr ala pro ser thr ile arg gln gly
 182/61 212/71
 AGC TCA GCG CGA AAC GTC ACC GCG TTC GGG GCA CGA GAG CAC GGA CCG GGC ATC CCG CCG
 thr ser ala arg asn val thr ala phe gly ala pro glu his gly pro gly met pro arg
 242/81 272/91
 GTC TCG GAC GGT CCG GCG CCA TCG ACG CCG GAC GAG GTC CCG GCG TCG AGC ACC CTG CCG
 val ser asp gly arg ala pro ser thr pro asp glu val ala val ser ser thr leu gly
 302/101
 CGA AAC GTC GGC GAC GAT C
 arg asn leu gly asp asp

SEQ ID N° 9B

FIGURE 9B

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33/11
 AGG GCG AGC GAA CCG TCG ATT CCA TGG GTG TCG AGC CAT TCG TGG TCA AGG CCG GCG CCG
 arg pro ser glu pro ser ile pro trp val ser thr his ser trp ser arg pro ala arg
 63/21
 CAG GAC CGT TCC TGG GTT CGA CAC CAT TCG CCC AAA TCG ACC TGC CCC AGG TTG CTC GTG
 gln asp arg ser trp val arg his his ser pro lys ser thr cys pro arg leu leu val
 123/41
 CCG CTG GCG TCT TGG CTG CCG CCC CAC TAG CGA CTG CCG CGT CGA CGA TCC GCG AGG GCA
 arg leu ala ser trp leu pro pro his AMB arg leu arg arg arg arg ser gly arg ala
 183/61
 CGT CAG GCG GAA ACG TCA CCG CGT TCG GCG CAC CAG AGC ACG GAC CCG GCA TGC CCG GCG
 arg gln arg glu thr ser pro arg ser gly his gln ser thr asp pro ala cys arg gly
 243/81
 TCT GGG AGC CTC GGG CCG CAT CGA CCG CCG AGG AGG TCG CCG TGT CGA GCA CCG TGG GCG
 ser arg thr val gly arg his arg arg arg thr arg ser arg cys arg ala arg trp ala
 303/101
 GAA ACC TCG GCG ACG ATC
 glu thr ser ala thr ile

SEQ ID N° 9C

FIGURE 9C

31/11
 TTA AGC ACT CAG ACG GAA ACG CTT GAA CCG CGA GGT CCG TCC GGA CAG GAA TTT GAC TCG
 leu thr thr gln thr glu thr leu glu pro arg gly arg ser gly his gln phe asp ser
 61/21
 GGT CTT TGG CAA TTG AAG GTG AGC TGC GAG CAG CCG GGT GAC CCG ATC GTT GCG CTT GCG
 ala leu trp gln leu lys val ser cys glu pro pro gly asp arg ile val gly leu ala
 121/41
 ATC AAT GCG CCG CTC GCG GAC GTA GAT AAT CAG CTC ACC GTT GCG ACC GAC CTC GAC CAG
 ile asn arg arg leu ala asp val asp asn gln leu thr val gly thr asp leu asp gln
 181/61
 GGG TCC TTT GTG ACT GCG GGG CTT GAC GCG GAC GAC CAG AGA GTC GGT CAT CCG CTA AGC
 gly ser phe val thr ala gly leu asp ala asp asp his arg val gly his arg leu arg
 241/81
 CTA CCG TTC TGA CTT GGG GCT GCG TGG CCG CCG ACC ACG TGA GCG ACG TCA TGT CTC AGC
 leu pro pro phe CTA pro gly ala ala trp ala pro thr thr CTA gly thr ser cys leu ser
 301/101
 GCG CCA CCG CCA CTT CCG TCG CCG GCA GTA TGT CAG CAT GTG CAG ATG ACF CCA CCG AGC
 gly pro pro pro arg ser pro ala val cys gln his val gln met thr pro arg ser
 361/121
 CTT GTT GCG ATC GGT GGT CTC GTG GTT GCG ACG ACC TTG GCG CTC GTG AGC GCA CCG CCG
 leu val arg ile val gly val val val ala thr thr leu ala leu val ser ala pro ala
 421/161
 GCG GGT COT GCG CCG CAT CCG GAT C
 gly gly arg ala ala his ala asp

SEQ ID N° 10A

FIGURE 10A

31/185

32/11
TAA CGA CTC AGA CGG AAA CGC TTG AAC CGC GAG GTG GGT CCG GAC ACC AAT TTG ACT GGG
OCH arg leu arg arg lys arg leu aan arg glu val ala pro asp thr asn leu thr arg
62/21
CTC TTT GGC AAT TGA AGG TGA GCT GCG AGC AGC GGG GTG ACC GCA TCG TTG GGC TTG GCA
leu phe gly asn OPA arg OPA ala ala ser ser arg val thr ala ser leu ala leu pro
122/41
TCA ATC GGC GGC TCG CGG ACG TAG ATA ATC AGC TCA CCG TTG GGA CCG ACC TCG ACC AGG
ser ile ala gly ser arg thr AMB ile ile ser ser pro leu gly pro thr ser thr arg
182/61
GGT CCT TTG TGA CTG CCG GGC TTG ACG CGG ACG ACC ACA GAG TCG GTC ATC GGC TAA GGC
gly pro leu OPA leu pro gly leu thr arg thr thr thr glu ser val ile ala OCH gly
242/91
TAC CGT TCT GAC CTG GGG CTG CGT GGG CGC CGA CCA GGT GAG GCA GGT CAT GTC TCA GGC
tyr arg ser asp leu gly leu arg gly arg arg arg arg glu ala arg his val ser ala
302/101
GCC CAC CGC GAC CTC GGT CGC CCG CAG TAT GTC AGC ATG TGC AGA TGA CTC CAC GCA GGT
ala his arg his leu gly arg arg gln tyr val ser met cys arg OPA leu his ala ala
362/121
TTG TTG GCA TCG TTG GTG TCG TCG TTG OPA CGA CCG TCG CGC TCG TGA GGC CAC CGC CGC
leu phe ala ser leu val ser xip leu arg arg pro trp arg xip OPA ala his pro pro
422/141
GGG GTC GTG CCG CGC ATG CAG ATC
ala val val pro arg met arg ile

SEQ ID N° 10B

FIGURE 10B

33/11
AAC GAC TCA GAC GGA AAC GCT TGA ACC GCG AGG TCG CTC CGG ACA GCA ATT TGA CTC GGC
asn asp ser asp gly asn ala OPA thr ala arg ser leu arg thr pro ile OPA leu gly
62/21
TCT TTG GCA ATT GAA GGT GAG CTG CGA GCA GGC GGG TGA CCG CAT GGT TCG CCT TGC CAT
ser leu ala ile glu gly glu leu arg ala ala gly OPA pro his arg trp pro cys his
123/41
CAA TCG CCG GCT CGC GGA GGT AGA TAA TCA GCT CAC CGT TCG GAC CGA CTT CGA CCA GGC
gln ser pro ala arg gly arg arg OCH ser ala his arg trp asp arg pro arg pro gly
183/61
GTC CTT TGT GAC TGC CCG GGT TGA CGC GGA CGA CCA CAG AGT GGG TCA TCG CCT AAG GGT
val leu cys asp cys arg ala OPA arg gly arg pro gln ser arg ser ser pro lys ala
243/81
ACC GGT CTG ACC TCG GGC TGC GTG GCG GGC GAC GAC GTG AGG CAC GTC ATG TCT CAG CGG
thr val leu thr trp gly cys val gly ala asp asp val arg his val met ser gln arg
303/101
GCC ACC GGC ACC TCG GTC GGC GGC AGT ATG TCA GCA TGT GCA GAT GAC TCG ACC CAG GGT
pro thr ala thr ser val ala gly ser met ser ala cys ala asp asp for thr gln pro
363/121
GCT TCG CAT GGT TCG TGT CGT GGT TGC GAG GAC CTT GGC GGT GAT GAG GGC ACC GGC CGG
cys ser his arg trp cys arg gly cys asp asp leu gly ala gly glu asp thr arg arg
423/141
CGG TCG TCG CAG GCA TCG GGA TC
arg ser cys arg ala cys gly

SEQ ID N° 10C

FIGURE 10C

FEUILLE DE REMPLACEMENT (REGLE 26)

32/105

31/11
 CCC GAA GAG GTC CCC GGT TTT GTT AAT TTT TAA AAA ATT TGT GTC ACA AAC CGG GGT ACC
 pro glu glu val pro arg phe val asp phe OCH lys ile oys val thr lys arg gly thr
 61/21
 AAG GCA TAA AAC CTA GTA CTT GGG CGC CGC GAT TCA ACC AAA AGC GAG TGG GGG TAG TCA
 lys ala OCH asn leu val pro gly ala ala asp ser thr lys thr glu trp gly AMB ser
 121/41
 GGG CGG TGC ATT CGG AGC ACC CTG TAC GAG CGC CGT GTG GCA AGC CGG ATG AGT GCG CGC
 gly ala oys ile pro thr thr leu tyr asp pro leu val ala thr pro met ser ala pro
 181/61
 AGC AAG GCC GAG CGA CGG GCT GCT GGC GCT GAC CGC CGC GGA AGC CGC CGA GTG CAT GGT
 thr lys ala glu arg arg ala ala gly ala asp arg arg gly ser arg arg val asp gly
 241/81
 CAC CAC CGC GAC CGC ACC GGT AGC GAT CGC GGC TGG GGT TAC GGT GCG GGT CAA CGC
 his his arg pro his pro thr gly thr asp arg ala ser gly tyr arg arg arg glu arg
 301/101
 GCG GGA CAG CAT CGG TCC CGC CTA GGT CAA TCC ACT CAT GCA GCG GCG CAA CGA ACA GGT
 ala gly gin his arg ser pro leu gly gin oys thr his ala ala pro glu arg thr ala
 361/121
 CAA CCC TTG AAC CGG GTC CGG GCC TGC CGA CCC TGG GCG GAC GCG GTG CGC ATA GGT GAT
 glu pro leu asn arg val pro ala oys arg pro ser ala ala gly val pro leu arg asp
 421/141
 AGA CAC AGG GGC ATG GAA AGC CTG GCG AGC CGG ATG CTA TTT CGG CGC CGG GAC TAT CAG
 arg his arg ala met glu ile leu ala ser arg met leu leu arg pro ala asp tyr glu
 481/161
 CGG TCG CTG AGC TTC TAC GGT GAC CAG ATC
 arg ser leu ser phe tyr arg asp glu ile

SEQ ID N° 11A

FIGURE 11A

32/11
 CGG AAG AGG TCC CCC GTT TTC TTA ATT TTT AAA AAA TTG GTG TGA CAA AGC GGG GTA CCA
 pro lys arg ser pro val leu leu ile phe lys lys phe val ser gin ser gly val pro
 62/21
 AGC CAT AAA ACC TAG TAC CTG GGG CGC CGG ATT CAA GGA AAA CGG AAT GCG GGT AGT CAT
 arg his lys thr AMB tyr leu gly arg arg ile gin arg lys pro ser gly gly ser glu
 122/41
 GGG CGT GCA TTC CGA CGA CGC TGT AGC ACC CGC TGG TGG GAA CGC GGA TGA GTG CGC CGA
 gly arg ala phe arg arg pro oys thr thr arg trp trp gin arg arg CPA val arg arg
 182/61
 CGA AGG CGC AGC GAC CGG CTG CGC GCG CTG ACC GCT GCG GAA GCG GCG GAG TGG ATG GTC
 arg arg pro ser asp gly leu pro ala leu thr ala ala ala glu ala ala glu trp met val
 242/81
 ACC AGC GGC CGC ACC CGA CGC GGA CGG ATC GCG GCT GGG GTT ACC GTC GCG GTC ACC CGC
 chr thr ala arg thr arg pro val arg ile ala pro arg val thr val ala val asn ala
 302/101
 CTG GAC GAC ATC GGT GCG CGC TGG GTC AAT GCA TTT ATG CAG CGC GCG AAC GAA CAG CTC
 leu asp ser ile gly pro arg trp val asn ala leu met glu arg arg asn glu gin leu
 362/121
 AAG CCG TGA ACC GGG TCC CGG GCT GGC GAC CCG CGG CGG CGG GCG TGC CGC TAC CTC ATA
 asn pro CPA thr gly ser arg pro ala asp pro arg pro pro ala oys arg tyr val ile
 422/141
 AGC ACA GGG GCA TGG AAA TCC TGG CCA GCG GGA TCC TAC TTC GCG CGG GCG AGT ATC AGC
 asp thr gly pro trp lys ser trp pro ala gly oys tyr phe gly arg arg thr ile ser
 482/161
 GGT CGC TGA GCT GCT ACC GTC AGC AGA TC
 gly arg CPA ala ser thr val thr arg

SEQ ID N° 11B

FIGURE 11B

FEUILLE DE REMPLACEMENT (REGLE 26)

33/185

33/11
 CGA AGA GGT CCC CCG TTT TGT TAA TTT TTA AAA AAT TTT TGT CRC AAA GCG GCG TAC CAA
 arg arg gly pro pro phe cys och phe leu lys asn leu cys his lys ala gly tyr gln
 63/21 93/31
 GGC ATA AAA CCT AGT ACC TGC GCG GCG GGA TTC AAC GAA AAC CGA GTG GGG GTA GTC AGG
 gly ile lys pro ser thr trp gly gly gly phe asn glu asn arg val gly val val arg
 123/41 153/51
 GGC GTG CAT TCC GAC GAC CCT GTA CGA CCC SCT GGT GGC AAC GCG GAT GAG TGC GCC GAC
 gly val his ser asp asp pro val arg pro ala gly gly asn ala asp glu cys ala asp
 183/61 213/71
 GAA GCG CGA GCG AGG GGC TGC CCG CGG TGA CCG CCG CGG AAG CCG CCG AGT GGA TGG TCA
 glu gly arg ala thr gly cys arg arg opa pro pro arg lys pro pro ser gly trp ser
 243/81 273/91
 CCA CCG CCC GCA CCG GAC CCG TAC GGA TCG CCG CTC GGG TTA CCG TCG CCG TCA AGC CCG
 pro pro pro ala pro asp arg tyr gly ser arg leu gly leu pro ser pro ser thr arg
 303/101 323/111
 TGG ACA GCA TCG GTC CCG GGT GGG TCA ATG CAC TCA TCC AGC GCG GCA AGC AAC AGC TCA
 asp thr ala ser val pro ala gly ser met his ser cys ser ala ala thr asn ser arg
 363/121 393/131
 ACC CTT GAA CCG GGT CCC GGC CTG CCG ACC CTC GCG GCG GCG GGT GCG GCT AGC TCA TAG
 thr leu glu pro gly pro gly leu pro thr leu gly arg arg arg ala ala thr opa ans
 423/141 453/151
 ACA CAG GCG CAT GGA AAT CCT GGC CAG CCG GAT GCT ACT TCG GCC GGC GGA CTA TCA CCG
 thr gln gly his gly asn pro gly gln pro asp ala thr ser ala gly gly leu ser ala
 483/161
 GTC GCT GAG CTT CTA CCG TGA CCA GAT C
 val ala glu leu leu pro opa pro asp

SEQ ID N° 11C

FIGURE 11C

partie de la séquence nucléotidique de Seq11

1/1 31/11
 CGT CCG CGT CAA CCG GGT GGA CAG CAT CCG TCC CCG CTG GGT CAA TGG AGT CAT GCA GCG
 arg arg arg gln arg ala gly gln his arg ser pro leu gly gln cys thr his ala ala
 61/21 91/31
 CCG CAA CGA ACA GGT CAA CCC TTG AAC CCG CTC CCG GCG TGC CGA CCC TGG GCC GCC GCG
 pro gln arg thr ala gln pro leu asn arg val pro ala cys arg pro ser ala ala gly
 121/41 151/51
 GTG CCG CTA GGT GAT AGA CAG AGC GCG ATG GAA ATC CTT GCG AGC CCG ATG CTA CTT GCG
 val pro leu arg asp arg his arg ala met glu ile leu ala ser arg met leu leu arg
 181/61 211/71
 CCG GCG GAC TAT CAG CCG TCG CTG AGC TTC TAC CTT GAC CAG ATC
 pro ala asp tyr gln arg ser leu ser phe tyr arg asp gln ile

SEQ ID N° 11A'

FIGURE 11A'

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1/1                               31/11
GTC GCG CTC AAC GCG CTG GAC AAC ATC GGT CCG GCG TGG GTC AAT GCA CTC ATG CAG GCG
val ala val asp ala leu asp ser ile gly pro arg trp val asn ala leu met gln arg
51/21                               91/31
GCG AAC GAA CAG CTC AAC CCG TGA ACC GGG TCG GCG GCT GCG GAC GGT GGG CCG CCG GCG
arg asn glu gln leu asn pro opa thr gly ser arg pro ala asp pro arg pro pro ala
121/41                               151/51
TGC GCG TAC GTG ATA GAC ACA GGG CGA TGG AAA TCG TGG CGA GCG GGA TGC TAC TTC GCG
cys arg tyr val ile asp thr gly pro trp lys ser trp pro ala gly cys tyr phe gly
181/61                               211/71
GCG GCG ACT ATC AGC GGT CCG TGA GGT TGT ACC GTS ACC AGA TC
arg arg thr ile ser gly arg opa ala ser thr val thr arg

```

SEQ ID N° 11B'

FIGURE 11B'

```

1/1                               31/11
TGC CCG TCA ACG GCG TGG ACA GCA TCG CTC CGC GGT GGG TCA ATG CAG TCA TCG ACC GCG
ser pro ser thr arg trp thr ala ser val pro ala gly ser met his ser cys ser ala
51/21                               91/31
GCA ACG AAC AGC TCA ACC GTT GAA CCG GGT CCG GCG CTG CCG ACC CTC GCG CCG CCG CCG
ala thr asn ser ser thr leu glu pro gly pro gly leu pro thr leu gly arg arg arg
121/41                               151/51
GCG GGT ACG TGA TAG ACA CAG GCG CAT GGA AAT CCG GCG CAG GAT GGT ACT TCG GCG
ala ala thr opa amc thr gln gly his gly asp pro gly gln pro asp ala thr ser ala
181/61                               211/71
GCG GGA CTA TCA GCG GTC GGT GAG CTT CTA CCG TGA CCA GAT C
gly gly leu ser ala val ala glu leu leu pro opa pro asp

```

SEQ ID N° 11C'

FIGURE 11C'

séquence RV0546c prédite par par Cola et al. (Nature 393:537-544) et contenant Seq11a'

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1/1                               31/11
ATG GAA ATC CTG GCG AGC GGG ATG CTA CTT GGG GCG GCG GAC TAT CAG GGG CCG CTG AGC
Met glu ile leu ala ser arg met leu leu arg pro ala asp tyr gln arg ser leu ser
51/21                               91/31
TTC TAC CGT GAC CAG ATC GGG CTG GCG ATT CCG GGT GAA TAC GGG GCG GCG ACA GTG TTC
phe tyr arg asp gln ile gly leu ala ile ala arg glu tyr gly ala gly thr val phe
121/41                               151/51
TTC GCG GGT CAG CAA CTG CTA GAA CCG GCG GGT TAC GCG GAG CCG GAC CAT CCG GGG GGA
phe ala gly gln ser leu leu glu leu ala gly tyr gly glu pro asp his ser arg gly
181/61                               211/71
CGT TTT CCG GGG GGG CTG TGT CTG CAG GTG CCG GAC CTA GAG GAT ACC CAG ACC GAG ATG
pro phe pro gly ala leu trp leu gln val arg asp leu glu ala thr gln thr glu leu
241/81                               271/91
GTC AGC CGA GGC GTG TCG ATC GGT CCG GAG CCG GCG CCG GAG CAG TGG GCG CTG CAC GAG
val ser arg gly val ser ile ala arg glu pro arg arg glu pro trp gly leu his glu
301/101                               331/111
ARG CCG GTG ACC GAC CCA GAC GGG ATC ATA CTG ATA TTC GTG GAG GTT CCG GAG GGT CAC
met his val thr asp pro asp gly ile thr leu ile phe val glu val pro glu gly his
361/121
GCG CTG GGT ACA GAC ACC GGG GCG TGA
pro leu arg thr asp thr arg ala opa

```

SEQ ID N° 11D

FEUILLE DE REMPLACEMENT (REGLE 26)

35/185

ORF prédite par par Cole et al. (Nature 393:537-544) et contenant Rv0546c

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1/1 31/11
taq taa ggg cgt gaa ttc gac gac gct gta cta ccc gct ggt ggc aac tcc gat gat tgc
AMB ser gly arg ala phe asp asp ala val leu pro ala gly gly asn ser asp asp cys
61/21 91/31
gcc gac gaa ggc cta cga cgg gct gcc ggc gct gac cgc cga gga agc cgc cga gtg gat
ala asp glu gly leu arg arg ala ala gly ala asp arg arg gly ser arg arg val asp
121/41 151/51
ggg cac cgc cgc ccg cac cng acc ggt gcc gat cgc gcc tcc ggt tgc cgt cgc cgc cga
gly his arg arg pro his pro thr gly ala asp arg ala ser gly cys arg arg arg gln
181/61 211/71
cgc gct gga cag cat cgg tcc ccg cng ggt aca tgc acc cat gaa gcc ccg caa cga aca
arg ala gly gln his arg ser pro leu gly gln cys thr his ala ala pro gln arg thr
241/81 271/91
gct caa ccc ttg aac cgg gtc ccg gcc tgc cga ccc tgg gcc gcc gcc gtg ccg cta cgt
ala gln pro leu asn arg val pro ala cys arg pro ser ala ala gly val pro leu arg
301/101 331/111
gat aga cac agg gcc arg gaa atc ctg gcc agc cgg ctg cta ctt ccg ccg gcc gcc tat
asp arg his arg ala met glu ile leu ala ser arg met leu leu arg pro ala asp tyr
361/121 391/131
cag cgg tng cng agc ttc taa cgt gac cag atc ggg ccg gcc att gcc cgt gaa tac ggg
gln arg ser leu ser phe tyr arg asp gln ile gly leu ala ile ala arg glu tyr gly
421/141 451/151
gcc ggc aca gtg ttt ttc gcc ggt cag tca ctg ctg gaa ctg gcc ggt tac gcc gac ccg
ala gly thr val phe phe ala gly gln ser leu leu glu leu ala gly tyr gly glu pro
481/161 511/171
gac cat ccg cgg gga cct ttt ccc gcc gcc ctg tgg ccg cag gtg cgc gac ctr gag gat
asp his ser arg gly pro phe pro gly ala leu trp leu gln val arg asp leu glu ala
541/181 571/191
acc cag acc gag ctg gtc agc cga gcc gtg tcc atc gct cgc gag ccc cgc cgc gaa ccg
thr gln thr glu leu val ser arg gly val ser ala ala arg glu pro arg arg glu pro
601/201 631/211
tgg gcc ctg cac gag atg cat gty acc gcc cca gcc ggg atc aca ctg ata ttc gtc gag
trp gly leu his glu met his val thr asp pro asp gly ile thr leu ile phe val glu
661/221 691/231
gta ccc gag ggt cac ccg ctg cgt aca gac acc cgg gcc tga
val pro glu gly his pro leu arg thr asp thr arg ala Q8A

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SEQ ID N° 11F

FIGURE 11F

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1/1                               31/11
gac cga agg gat ttc ggg act aac tgg gcc tgt aag gca aag cga ggt att cat gcc gag
asp arg arg asp phe ala thr asn ser ala cys lys ala thr arg gly leu his ala glu
61/21                               31/31
gac gta gcc agg aag aga cag gga agc tga tga cgt cgc gta cag gac cgc cat tct gcc
asp val asp arg lys arg gln gly ser opa opa arg arg val pro asp arg his ser val
121/41                               151/51
gag tct ttc cga gtt cag caa caa tgg aca cag aag cgg gga cca gac cgg gag gac gac
glu ser phe asg val gln gln gln ser thr gln lys arg gly pro asp arg glu asp asp
181/61                               211/71
ggc gcc cgg gcc gat tgg ggc cga gtc tct gag taa gac cag agt cac ggg tcc gtc tgt
ala ala arg ala ala ser gly arg val ser glu ooh asp gln ser his gly ser val cys
241/81                               271/81
gac aac cgc ggc gaa ttc aat cgg atg ggc ggc ggc acc gga ttc cgc cgg tca cgc agy
asp asn arg ala glu phe asn arg met ala gly gly thr gly leu arg arg ser pro arg
301/101
aac ctc cgg agt gat c
asn leu arg ser asp

```

SEQ ID N° 12A

FIGURE 12A

```

1/1                               31/11
acc gaa ggg att tag cga cta aat cgg tct gta aag cca cgc gag gtc ttc atg cgg agy
thr glu gly ile ser arg leu thr arg pro val arg gln arg glu val phe met pro arg
61/21                               91/31
cgc tag aca gga aga gac agy gaa gct gat gac gtc ggc tac cgg acc gaa att ctg tgg
thr AMB thr gly arg asp arg glu ala asp asp val ala tyr arg thr ala ile leu ser
121/41                               151/51
agt ctt tcc gag ttc agc aac aat cga cac aga agt ggg gac cag acc ggg agy cgg agc
ser leu ser glu phe ser asn asn arg his arg ser gly asp gln thr gly arg thr thr
181/61                               211/71
cgg ccc ggg cgg ctt cgg gcc gag tgt ctg agt aag acc aga gtc aag ggt cgg tgt ggc
arg pro gly pro leu arg ala glu cys leu ser lys thr arg val thr gly pro cys val
241/81                               271/81
aca acc ggc cgg aat tca att gga tgg cgg ggg gga cgg gat tgc gcc ggt cac cga gga
thr thr ala arg asn ser ile gly trp arg ala gly pro asp cys ala gly his arg gly
301/101
acc tcc gga gtc atc
thr ser gly val ile

```

SEQ ID N° 12B

FIGURE 12B

37/185

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1/1 31/11
cag aag gga ttt cgc gac taa ctc ggc ctg taa ggc aac ggc agg tct tca tgc cga gga
pro lys gly phe arg asp och leu gly leu och gly asn ala arg ser ser cys arg gly
61/21 91/31
cgt aga cag gaa gag aca ggg aag ctg atg aag tgg cgt acc gga cag cca ttc tgt cga
arg arg gln glu glu thr gly lys leu met thr ser arg thr gly pro pro phe cys arg
121/41 151/51
gtc ttt cag agt tca gaa aca atc gac aca gaa cgc ggg acc aga cag gga gga cga cgc
val phe pro ser ser ala thr ile asp thr glu ala gly thr arg pro gly gly arg arg
181/61 211/71
ggc cag ggc cgc ttc ggg cag agt gtc tga gta aga cca gag tca cgg gtc cgt gtg tga
gly pro gly arg gly pro ser val opa val arg pro glu ser arg val arg val opa
241/81 271/91
caa cgt cgc gga att caa tgg gat ggc ggg cgg gac cgg acc ggc cgg gtc acc gaa gaa
gln pro arg gly ile gln ser asp gly gly arg asp arg ala ala pro val thr glu glu
301/101
cct cag gag tga tc
pro pro glu opa

```

SEQ ID N° 12C

FIGURE 12C

```

1/1 31/11
ggg att tgc ttg ccc gat cga ttg ttt gta cgg ttt ggg aaa aac act tga agt cct ttt
gly ile ser leu pro asp gly leu phe val arg phe gly lys asn thr opa ser pro phe
61/21 91/31
tat tgc caa tgc tgc aaa tgg aca ttc cta tat tgc cgg aat taa cgc aac cgc gtg acc
tyr trp gln cys trp lys trp thr phe gln tyr cys ala asn och pro asn thr val arg
121/41 151/51
ggc cgc cta cgc ttt gta cgc ggc cca gca acc cgc cgc gac cgc ttg acc gaa cgc acc
gly gly gln ala phe val pro gly pro ala ser ala ala asp arg leu thr glu ala ser
181/61 211/71
atg ttg ttg tgt cag cgc cgc ctt ggt ttc gat gtc cgc cgc ttg cgt cga cgc ggt ggt
met leu leu cys gln arg gly leu gly leu asp val pro ala leu ala gly pro ala ser
241/81 271/91
tca aaa cag gtt gaa ctt aac gac tga aga acc gaa acc ctt gaa cgc cga ggt cgc ttc
ser lys gln val glu leu asn asp ser arg thr glu thr leu glu pro arg arg arg ser
301/101 331/111
gga cag caa ttt gac tgc cgt ctt tgg caa ttg aag tgc agc tgc gag cag cgc ggt gac
gly his gln phe asp ser ala leu trp gln leu lys val ser cys glu gln pro gly asp
361/121 391/131
cgc atc ctt ggc ctt ggc atc aat cgc cgc ctc gch gac gta gat aat cag ctc acc ctt
arg ile val gly leu ala ala asn arg arg leu ala asp val asp asn gln leu thr val
421/141 451/151
ggc acc gac ctc gac cag ggc tgc ttt tgc act gch ggc ctt gac cgc gac cag cag asa
gly thr asp leu asp gln gly ser phe val thr ala gly leu asp ala asp asp his arg
481/161 511/171
ctc ggt cat tgc tta agc cta cgc ttc tga cct ggc ggt cgc tgc cgc acc agc agc tga
val gly his arg leu arg leu pro phe opa pro gly ala ala tgc ala phe thr thr opa
541/181 571/191
aac acc tca tct ctc acc ggc cca cgc cca cct cgc tgc cgc gca gta tgc gac cat tgc
gly thr ser cys leu ser gly pro pro pro pro arg ser pro ala val cys gln his val
601/201 631/211
cag atg act cca cgc acc ctt gtt cgc atc gtt ggt gtc tgc gtt ctc acc acc ttg cgc
gln met thr pro asp ser leu val arg ala val gly val val ala thr thr leu ala
661/221 691/231
ctg tgc acc gca cgc cgc ggc ggt gct ggc ggc cat cgc gat c
leu val ser ala pro ala gly gly arg ala ala his ala asp

```

SEQ ID N° 13A

FIGURE 13A

FEUILLE DE REMPLACEMENT (REGLE 26)

38/185

32/11
 GGA TTT CGT TGC CCG ATG GAT TGT TTG TAC GGT TTG GGA AAA ACA CTT GAA GTC CTT TTT
 gly phe arg cys pro met asp cys leu tyr gly leu gly lys thr leu glu val leu phe
 62/21
 ATT GGC AAT GCT GGA AAT GGA CAT TCC AAT ATT GCG CGA ATT AAC CGA ACA CCG TGA CCG
 ile gly asp ala gly asn gly his ser asn ile ala arg ile asn arg thr arg oPa gly
 122/41
 GGG GGC AAG CST TTG TAC CCG GGC CAG CAA GCG CCG ACC GGT TGA CCG AAG CCA GCA
 gly gly lys arg leu tyr arg gly gln gln ala pro pro thr gly oPa pro lys pro ala
 162/61
 TGT TGT TGT GTC AGC GCG GGC TTG GTC TCG ATG TCG CCG CCT TGG CTG GAC CGC CTT CTT
 cys cys cys val ser ala gly leu val ser met ser arg pro trp leu asp pro leu leu
 242/81
 CAA AAC AGG TTG AAC TTA AGC ACT CAA GAA CCG AAA CCG TTG AAC CCG GAC GTC GCT CCG
 gln asn arg leu asn leu thr thr gln glu arg lys arg leu asn arg asp val ala pro
 302/101
 GAC ACC AAT TTG ACT CCG CTC TTT GGC AAT TGA AGC TGA GCT GCG AGC AGC CCG GTC ACC
 asp thr asn leu thr arg leu phe gly asn oPa arg oPa ala ala ser ser arg val thr
 362/121
 GCA TCG TTG GGC TTG CCA TCA ATG GCC GCG TCG CCG AGC TAG ATA ATC AGC TCA CCG TTC
 ala ser leu ala leu pro ser ile ala gly ser arg thr AME ile ile ser ser pro leu
 422/141
 GGA CCG ACC TCG ACC AGG GGT CCT TTG TGA CTG CCG GGC TTS ACC CCG ACC ACC ACA GAG
 gly pro thr ser thr arg gly pro leu oPa leu pro gly leu thr arg thr thr thr glu
 482/161
 TCG CTC ATC GCC TAA GGC TAC CCT TCT GAC CTG GGG CTG CCT GCG CCG CGA CGA CCT GAG
 ser val ile ala oCH gly tyr arg ser asp leu gly leu arg gly arg arg arg arg glu
 542/181
 GCA CGT EAT GTC TCA GCG GGC CAC CCG CAC CTC GGT CCG CCG CAG TAT GTC AGC ATG TGC
 ala arg his val ser ala ala his arg his leu gly arg arg gln tyr val ser met cys
 602/201
 AGA TGA CTC CAC GCA GCC TTG TTC GCA TCG TTG GTG TCG TGG TTG CGA CGA CCT TGG CCG
 arg oPa leu his ala ala leu phe ala ser leu val ser trp leu arg arg pro trp arg
 662/221
 TGG TGA GCG CAC CCG CCG GCG GTC GTG CCG CCG ATG CCG ATC
 trp oPa ala his pro pro ala val val pro arg met arg ile

SEQ ID N° 13B

FIGURE 13B

39/185

33/11
 GAT TTC GTT GCG CGA TCG ATT GTT TGT ACG GTT TCG GAA AAA CAC TTG AAG TCC TTT TTA
 asp phe val ala arg trp ile val cys thr val trp glu lys his leu lys ser phe leu
 63/21
 TTG GCA ATG CTG GAA ATG GAC ATT CCA ATA TTG CGC GAA TTA ACC GAA CAC GGT GAG GGG
 leu ala met leu glu met asp ile pro ile leu arg glu leu thr glu his gly glu gly
 123/41
 GGG GCA AGC GTT TGT ACC GGG GCC AGC AAG CGC CGC CGA CCG GTT GAC CGA AGC CAG CAT
 gly ala ser val cys thr gly ala ser lys arg arg arg pro val asp arg ser gln his
 183/61
 GTT GTT GTG TCA GCG CGG GCT TGG TCT CGA TGT CCC GGC CTT GGC TGG ACC CGT TTC TTC
 val val val ser ala arg ala trp ser arg cys pro gly leu gly trp thr arg phe phe
 243/81
 AAA ACA GGT TGA ACT TAA CGA CTC AAG AAC CGA AAC GCT TGA ACC GCG ACG TCG CTC CGG
 lys thr gly opa thr och arg leu lys asp gly asp ala opa thr ala thr ser leu arg
 303/101
 ACA CCA ATT TGA CTC GGC TCT TTG GCA ATT GAA GGT GAG CTC GGA CCA GGC GGG TGA CCG
 thr pro ile opa leu gly ser leu ala ile glu gly glu leu arg ala ala gly opa pro
 363/121
 CAT CGT TGG CCT TGC CAT CAA TCG CCG GCT CGC GGA CGT AGA TAA TCA GCT CAC CGT TGG
 his arg trp pro cys his gln ser pro ala arg gly arg arg och ser ala his arg trp
 423/141
 GAC CGA GCT CGA CCA GGG GTC CTT TGT GAC TGC CGG GCT TGA CCG GGA CGA CCA CAG AGT
 asp arg pro arg pro gly val leu cys asp cys arg ala opa arg gly arg pro gln ser
 483/161
 CCG TCA TCG CCT AAG GCT ACC GTT CTG ACC TGG GGC TGG GTG GGC GGC CAG GAC GTG ACG
 arg ser ser pro lys ala thr val leu thr trp gly cys val gly ala asp asp val arg
 543/181
 CAC GTC ATG TCT CAG CGG CCC ACC GGC ACC TCG GTC GCG GGC ACT ATG TCA GCA TGT GCA
 his val met ser gln arg pro thr ala thr ser val ala gly ser met ser ala cys ala
 603/201
 GAT GAC TCC ACC CAG CCT TGT TCG CAT CGT TGG TGT CTT GGT TGC GAC GAC CTT GGC GCT
 asp asp ser thr gln pro cys ser his arg trp cys arg gly cys asp asp leu gly ala
 663/221
 GGT GAG CGC ACC CGC CGG CCG TCG TCC CGC GCA TCG GCA TC
 gly glu arg thr arg arg arg ser cys arg ala cys gly

SEQ ID N° 13C

FIGURE 13C

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partie de la séquence nucléotidique de seq13A
 1/1 31/11
 GGG TCC TTT CCG ACT GCG GGG CTT GAC GCG GAC GAC CAC AGA GTC GGT CAT CGC GTA AGG
 gly ser phe val thr ala gly leu asp ala asp asp his arg val gly his arg leu arg
 61/21 91/31
 CTA CCG TTC TGA CCT GGG GCT GCG TGG GCG CCG AGC ACG TGA GGC ACG TCA TGT CTC AGC
 leu pro phe GPA pro gly ala ala trp ala pro thr thr GPA gly thr ser cys leu ser
 121/41 181/51
 GGC CCA CCG CCA CCT GCG TCG CCG GCA GTA TGT CAG CAT GTG CAG ATC ACT CCA CGC AGC
 gly pro pro pro pro arg ser pro ala val cys gln his val gln met thr pro arg ser
 181/61 211/71
 CTT GTT CCG ATC GTT GGT GTC GTG GTT GCG ACG AAC TTG GCG CTG GTG AGC GCA CGC GCG
 leu val arg ile val gly val val val ala thr thr leu ala leu val ser ala pro ala
 241/81
 GGC GGT CGT GCG GCG CAT GCG GAT C
 gly gly arg ala ala his ala asp

SEQ ID N° 13A'

FIGURE 13A'

1/1 31/11
 GGT CTT TTG TGA CTC GCG GCG TTG AGC CCG AGG ACC AGA GAG TCG GTC ATC GGC TAA GGC
 gly pro leu GPA leu pro gly leu thr arg thr thr thr gln ser val ile ala GCH gly
 61/21 91/31
 TAC CTT TCT GAC CTG GGG CTG CCG GCG CCG AGA GGA CCG GAG GCA GGT CAT GTC TCA GCG
 tyr arg ser asp leu gly leu arg gly arg arg arg arg gln ala arg his val ser ala
 121/41 151/51
 GGC CAC CCG CAC CTC GGT CCG CCG CAG TAT GTC ACG ATG TGC AGA TGA CTC CAC GCA GCG
 ala his arg his leu gly arg arg gln tyr val ser met cys arg GPA leu his ala ala
 181/61 211/71
 TTG TGC GCA TCG TTG GTG TCG TGG TTG GGA GGA CCG TGG CAC TCG TGA GCG CAC CGC CCG
 leu phe ala ser leu val ser trp leu arg arg pro trp arg trp GPA ala his pro pro
 241/81
 GCG GTC GTG CCG CCG ATG GCG ATC
 ala val val pro arg met arg ile

SEQ ID N° 13B'

FIGURE 13B'

1/1 31/11
 GTC CTT TGT GAC TGC CCG GCT TGA GCG GGA GGA GCA CAG AGT CCG TCA TCG GCT AAC GCT
 val leu cys asp cys arg ala GPA arg gly arg pro gln ser arg ser ser pro lys ala
 61/21 91/31
 ACC GTT CTG AGC TCG GCG TGC GTG GCG GCG GAC GAC GTC AGC CAC CTC ATG TCT CAG CAG
 thr val leu thr trp gly cys val gly ala asp asp val arg his val met ser gln arg
 121/41 151/51
 CCG AGC CCG AGC TCG GTC GCG GCG AGT ATG TCA GCA TGT GCA GAT GAG TCG AGG CAG CCG
 pro thr ala thr ser val ala gly ser met ser ala cys ala asp asp ser thr gln pro
 181/61 211/71
 TGT TCG CAT CCG TCG TGT CCG GGT TGC GAC GAC CTT GCG GGT GGT GAG CGC ACC GCG CCG
 cys ser his arg trp cys arg gly cys asp asp leu gly ala gly gln arg thr arg arg
 241/81
 GCG TCG TGC CCG GCA TGC GGA TC
 arg ser cys asp ala cys gly

SEQ ID N° 13C'

FIGURE 13C'

FEUILLE DE REMPLACEMENT (REGLE 26)

41/185

séquence Rv1984c prédite par Cole et al. (Nature 393:537-544) et contenant seq13A'

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1/1                               31/11
atg act cca cga agc ctt gtt cgc atc gtt ggt gtc ggg gtc ggg acg acc ttg cgg ctg
Met thr pro arg ser leu val arg ile val gly val val val ala thr thr leu ala leu
61/21                               91/31
gtg agc gca ccc gcc gcc ggt cgt gcc gcc cat ggg gat ccg tct tgg gac atc ggg gtc
val ser ala pro ala gly gly arg ala ala his ala asp pro cys ser asp ile ala val
121/41                               151/51
gtt ttc gct cgc gcc acg cat cag gct tct ggt ctt gcc gac gtc ggt gag gcc ttc gtc
val phe ala arg gly thr his gln ala ser gly leu gly asp val gly glu ala phe val
181/61                               211/71
gac tgg ctt acc tcg caa gtr gcc ggg cgg tgg att ggg gtc tgc gcc gtg aac tgc cca
asp ser leu thr ser gln val gly gly arg ser ala gly val tyr ala val aac tyr pro
241/81                               271/91
gca agc gac gac tac cgc gcc agc gcc tca aac ggt tuc gat gat ggg agc gcc cca atc
ala ser asp asp tyr arg ala ser ala ser asn gly ser asp asp ala ser ala his ile
301/101                               331/111
cag cgc acc gtc gcc agc tgc cgg aac acc agg att ggg ctt ggt ggc tat tgg cag ggt
gln arg thr val ala ser cys pro asn thr arg ile val leu gly gly tyr ser gln gly
361/121                               391/131
ggc aag gtc atc gat ttg tcc acc tgg gcc atg cgg ccc gcc gtg gca gat cat gtc gcc
ala thr val ile asp leu ser thr ser ala met pro pro ala val ala asp his val ala
421/141                               451/151
gct gtr gcc ctt ttc gcc gag cca tcc agt ggt ttc tcc agc atg ttg tgg ggc ggc ggg
ala val ala leu phe gly glu pro ser ser gly phe ser ser met leu trp gly gly gly
481/161                               511/171
tcg ttg ccg aca atc gcc cgg ctg tat agc tct aag acc ata aac ttg tgt gct ccc gac
ser leu pro thr ile gly pro leu tyr ser ser lys thr ile asn leu cys ala pro asp
541/181                               571/191
gat cca ata tgc acc gga gcc gcc aat att atg gcc csc gtc tgg tat gtt cag tgg ggt
asp pro ile cys thr gly gly gly asn ile met ala his val ser tyr val gln ser gly
601/201                               631/211
atg aca agc cag gcc gcc aca ttc gcc gcc aac agg ctc gat cac gcc gga tga
met thr ser gln ala ala thr phe ala ala asn arg leu asp his ala gly CFA

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SEQ ID N° 13D

FIGURE 13D

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Seq13F: ORF prédite par Cole et al. (Nature 393:537-544) et contenant Rv1984c

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1/1                               31/11
tga ggc acc tca tgc ctc agc ggc cca ccg cca cct cgg tcy cag gca gta tgt cag cat
OPA gly thr ser cys leu ser gly pro pro pro pro arg ser pro ala val cys gln his
61/21                               91/31
gtg cag atg act cca cgc agc ctt gth cgc atc gct cgt gtc cgc gtt cgc acc acc tgg
val gln met thr pro arg ser leu val arg ile val gly val val val ala thr thr leu
121/41                               151/51
ggc ccg gtc agc gta ccc gcc ggc ggt cgt gcc ggc cat cgc gat ccg tgt tgg ggc atc
ala val val ser ala pro ala gly gly arg ala ala his ala asp pro cys ser asp ile
161/61                               211/71
ggc gtc gtt ttc gcc cgc ggc acc cca cag gct tct ggt ctt gcc gac gtc ggt gag ggc
ala val val phe ala arg gly thr his gln ala ser gly leu gly asp val gly glu ala
241/81                               271/91
ttc gtc gac tgg ctt acc tgg cca gtt ggc ggc cgc tgc att ggg gtc tac gcc gtc aac
phe val asp ser leu thr ser gln val gly gly arg ser ile gly val tyr ala val asp
301/101                               331/111
tac cca gca agc gac gac tac cgc gcc agc gcc tca aac ggt tca gat gat gcc agc gcc
tyr pro ala ser asp asp tyr arg ala ser ala ser asn gly ser asp asp ala ser ala
361/121                               391/131
cac atc cag cgc acc gtc gcc agc tgc ccg aac acc cgg att gtc ata ggt gcc cat tcy
his ile gln arg thr val ala ser cys pro asn thr arg ala val leu gly gly tyr ser
421/141                               451/151
cag ggt gcc acc gtc atc gat tgg tcc acc tgg gcc atg ccg ccc gcc gtc gca gat cat
gln gly ala thr val ile asp leu ser thr ser ala met pro pro ala val ala asp his
481/161                               511/171
gtc gcc gac gtc gcc ctt ttc gcc gag cca tcc agt ggt tta tcc acc atg tgg tgg gcc
val ala ala val ala leu phe gly glu pro ser ser gly phe ser ser met leu trp gly
541/181                               571/191
ggc ggc tgg tgg ccg acc auc ggt ccg ctc tat agc tct aag acc ata aac tgg tgc gct
gly gly ser leu pro thr ile gly pro leu tyr ser ser lys thr ile asn leu cys ala
601/201                               631/211
acc gac gat cca ata tgc acc gga gcc gcc sat att arg gcc cat gtt tgg tat gtt cag
pro asp asp pro ile cys thr gly gly gly asn ile met ala his val ser tyr val gln
661/221                               691/231
tcg ggg atg acc agc cag gcc ggc acc ttc gcc gcc aac agc ctc gat cac gcc gga tga
ser gly met thr ser gln ala ala thr phe ala ala asn arg leu asp his ala gly opa

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SEQ ID N° 13F

FIGURE 13F

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31/11
 CCA CCG GGG CTG GAG GGG CGA ATG TGC GCC GAA CGC GGT CGG CCA ACT TGG CCG CTG AGG
 pro pro gly leu glu gly arg met cys ala glu arg ser arg pro thr trp pro leu arg
 61/21 91/31
 GCG GCT GAT CCC CTG GCC CGA GAC GGG GCA AGC CAA TAG CGG CTC CAT CCG GCT TTG CTG
 ala ala asp pro leu ala arg asp gly ala ser glu AMB arg leu his arg ala leu leu
 121/41 151/51
 GTA GCG GGT CGG CGG GAA CCG AGC GCU GAC GTT GTC CGT GGC CGG TGA TAT ATT GGG TCA
 val ala val arg arg glu pro ser ala asp val val gly ala arg OPA tyr ile gly ser
 181/61 211/71
 GAC GGG TAT GGC GGC GAC TGA GGT GAT CTG CGA CAC GCC GCG GCG GTC CTC GAG CCA GGC
 asp gly tyr gly gly asp OPA gly asp leu arg his ala ala ala val leu glu pro gly
 241/81 271/91
 TTA CCA CCA GGG AAT TTC GAA AAT GTT ATT CAG AAC ATC TTG TAT GTU TTC CTC CCT GGC
 leu arg pro gly asn phe glu asn val ile gln asn ile leu tyr leu phe leu arg ala
 301/101 331/111
 ACC GCC TAG GTG TAG TGT TTT CGA GTA CCG GCA GAT CCC AGT TCA CCA GTC TGA CCA GAT
 thr pro AMB val AMB cys phe arg val pro ala asp pro ser ser pro val ser pro asp

C

SEQ ID N° 14A

FIGURE 14A

32/11
 CAC CGG GGC TGG AGG GGC GAA TGT GCG CCG AAC GCC GTC GGC CAA GTT GGC CGC TGA GGG
 his arg gly trp arg gly glu cys ala pro asn ala val gly gln leu gly arg OPA gly
 62/21 92/31
 CCG CTG ATC CCC TGG CCC GAG ACG GGG CAA GCC AAT AGC GGC TGC ATC GGC GTT TGC TGA
 arg leu ile pro trp pro glu thr gly gln ala asn set gly ser ile gly leu cys trp
 122/41 152/51
 TAG GCG TTC GGC GGG AAC CGA GCG CCG ACG TTS TCG GTC CCC GGT GAT ATA TTG GGT CAG
 AMB arg phe gly gly asn arg ala pro thr leu ser val pro gly asp ile leu gly gln
 182/61 212/71
 ACG GGT ATG GCG GCG ACT GAG GTG ATC TGC GAC ACG CCG CCG GCG TGC TCG AGC CAG GGT
 thr gly met ala ala thr glu val ile cys asp thr pro pro arg cys ser ser gln ala
 242/81 272/91
 TAC GAC CAG CGA ATT TCG AAA ATG TTA TTC AGA ACA TCT TGT ATC TCT TCC TCC GTG CGA
 tyr asp gln gly ile ser lys met leu phe arg thr ser cys ile ser ser ser val pro
 302/101 332/111
 CCC CCT AGG TGT AGT GTT TTC GAG TAC CCG CAG ATC CCA GTT CAC CAG TCT CAC CAG ATC
 pro pro arg cys ser val phe glu tyr arg gln ile pro val his gln ser his gln ile

SEQ ID N° 14B

FIGURE 14B

44/185

33/11
 ACC GGG GCT GGA GGG GGC AAT GTG CGC CGA ACG CGC TCG GGC AAC TTG GCC GCT GAG GGC
 thr gly ala gly gly ala asn val arg arg thr pro ser ala asn leu ala ala glu gly
 63/21
 GGC TGA TCC CCT GGC CCG AGA CAG GGC AAG CCA ATA GCG GCT CCA TCG GGC TTT GCT GGT
 gly GGA ser pro gly pro arg arg gly lys pro ile ala ala pro ser gly phe ala gly
 123/41
 AGC GGT TCG CGG GGA ACC GAG CCU CGA CGT TGT GGG TGC CGS GTG ATA TAT TCG GTC AGA
 ser gly ser ala gly thr glu arg arg arg cys arg cys pro val ile cys trp val arg
 183/61
 CGG GTA TGG CGG CGA CTG AGG TGA TCT GCG ACA CGC CGC CGC GGT GCT CGA GGC AAG CTT
 arg val trp arg arg leu arg GGA ser ala thr arg arg arg gly ala arg ala arg leu
 243/81
 ACG ACC AAG GAA TTT CGA AAA TGT TAT TCA GAA CAT CTT GTA TCT CTT CCT GCG TGC CAC
 thr thr arg glu phe arg lys cys tyr ser glu his leu val ser leu pro pro cys his
 303/101
 CCC CTA GGT GTA GTG TTT TCG AGT ACG GGC AGA TCC CAG TTC ACC AGT CTC ACC AGA TC
 pro leu gly val val phe ser ser thr gly arg ser gln phe thr ser leu thr arg

SEQ ID N° 14C

FIGURE 14C

partie de la séquence nucléotidique de seq14A

1/1 31/11
 TTT TCG AGT ACC GGC AGA TCC CAG GTT CAC CAG GTC TCA CCA GAT C
 phe ser ser thr gly arg ser gln val his gln val ser pro asp

SEQ ID N° 14A'

FIGURE 14A'

1/1 31/11
 TGT TTT CGA GTA CCG GCA GAT CCC AAG TTC ACC AAG TCT CAC CAG ATC
 cys phe arg val pro ala asp pro arg phe thr arg ser his gln ile

SEQ ID N° 14C

FIGURE 14C

1/1 31/11
 GGT TTC GAG TAC CCG CAG ATC CCA GGT TCA CCA GGT CTT ACC AGA TC
 val phe glu tyr arg gln ile pro gly ser pro gly leu thr arg

SEQ ID N° 14C'

FIGURE 14C'

FEUILLE DE REMPLACEMENT (REGLE 26)

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ORF prédite d'après la séquence publiée par Cole et al. (Nature 393:537-544) et contenant seq14A'

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1/1
TAG CAG TTC GGC GGG AAG CTA GCG GCG ACC TTG TCG GTG GCC GGT GAT ATA TTG GGT CAG
AMB arg phe gly gly lys leu ala ala thr leu ser val ala gly asp ile leu gly gln
61/21
ACG GGT ATG GCG GCG CCT GAG GTG ATC TGC GAC ACG CCG CCG CCG TCG TCG ACC CAG GGT
thr gly met ala ala ala glu val ile cys asp thr pro pro arg cys ser ser gln ala
121/41
TAC GAC CAG GGA ATT TCG AAA AAG TTA TTC AGA ACA TCT TGT ATC TCT TCT CCG TGC CAC
tyr asp gln gly ala ser lys met leu phe arg thr ser cys ile ser ser pro cys his
181/61
CCC CTA GGT GTA GTG TTT TCG AGT ACC GCG AGA TCC CAG GTT CAC CAG GTC TCA CCA gat
pro leu gly val val phe ser ser thr gly arg ser gln val his gln val ser pro asp
241/81
CCA CGG GGC GCG ATG AAC CTC CCG GGA TCG GCA CCG CCA GGT CGA CCG ACG TGG TGG CGC
pro arg gly ala met asn phe pro ala ser ala ser pro gly arg arg thr trp ser arg
301/101
TAT GAC GGG AAT CTG GAG GCT TGT CCG GCG GGT CAA CAT ATC GAA GAT GCA GAA CTT GAG
tyr asp gly asn leu glu pro cys arg ala ala gln his ile glu asp ala leu leu glu
361/121
TCG TTG CCA GAT CCT GTC AGA TTC CCG ATT TCC GCA AAG GAG CCG TAC GCC CAT GAC CGT
tcg ttg cca gat cct gtc aga ttc ccg att tcc gca aag gag ccg tac gcc cat gac cgt
421/141
GAC CGT TTA CAA TAA
asp arg leu his OCH

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SEQ ID N° 14F

FIGURE 14F

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Séquence RV3054c prédite par Cole et al. (Nature 393:537-544)
pouvant être en phase avec Seq14A'

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1/1                               31/11
gtg tca gct acc aag tcc gac atc aaa atc ttg gcc tta gtg gga agc cag cgc ggc ggc
val ser asp thr lys ser asp ile lys ile leu ala leu val gly ser leu arg ala ala
61/21                               51/31
cag ttc aac cgc cag atc gcc gag ctg gct gcc aag gtc gcc cag gac ggc gtc acc gtc
ser phe asn arg gln ile ala glu leu ala ala lys val ala pro asp gly val thr val
121/41                               151/51
acc atg ttc gag ggg ctg ggg gac ctg cgc ttc tcc aac gaa gac atc gac aca ggc acg
thr met phe glu gly leu gly asp leu pro phe tyr asn glu asp ile asp thr ala thr
181/61                               211/71
gag ctg cgc ggc cag gtc agc ggc ttg cgc gag gcc ggc tcc gac ggc cac gct gcc ttg
glu val pro ala pro val ser ala leu arg glu ala ala ser asp ala his ala ala leu
241/81                               271/91
gtg gtc acg cag gaa tcc aac ggc agc att cgc gcc gtc atc aag aac ggc atc gac tgg
val val thr pro glu tyr asn gly ser ile pro ala val ile lys asn ala ile asp trp
301/101                               331/111
ctg tcc agg cca ttc gac gat ggc ggc ttg aag gac aag cgc ttg gcc gtc atc ggc ggc
leu ser arg pro phe gly asp gly ala leu lys asp lys pro leu ala val ile gly gly
361/121                               391/131
tcc atg ggc cgc tac gcc ggc gta tgg ggc cac gac gag act cgc aag tgg ttc agc atc
ser met gly arg tyr gly gly val trp ala his asp glu thr arg lys ser phe ser ile
421/141                               451/151
gct ggc acg cgc gtc gtc gat gcc atc aaa ctg tgg gtc cgc ttc cca act ctg gcc aag
ala gly thr arg val val asp ala ile lys leu ser val pro phe gln thr leu gly lys
481/161                               511/171
tgg gtc ggc gac gac gcc ggc cgc gcc aat gtc cgc gac gcc gtc gcc aac ttg gcc
ser val ala asp asp ala gly leu ala ala asn val arg asp ala val gly asn leu ala
541/181
gct gag gtc gcc tga
ala glu val gly opa

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SEQ ID N° 14R

FIGURE 14R

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ORF prédite par Cole et al. (Nature 393:537-544) et contenant Rv3054c

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1/1                               31/11
taa cgc gat cgg aat aaa tgc gac cat ggt cgg gtt ggc tgc tgc aag gac gtg gac caa
ccn arg asp arg asn lys ser asp his gly pro val gly ser cys lys asp val asp gin
61/21                               51/31
caa gcg gaa agg aac gta gca gtg tca gat acc aag tcc gac atc aaa atc ttg gcc tta
gin ala glu arg asn val ala val ser asp thr lys ser asp ile lys ile leu ala leu
121/41                              151/51
gtg gga agc ctc cgc gcg gcc tgc ttc aac cgc cag atc gcc gag atg gct gcc aag gtc
val gly ser leu arg ala ala ser phe asn arg gin ile ala glu leu ala ala lys val
161/61                              211/71
gct cgc gac gcc gtc acc gtc acc atg ttc gag ggg ctc ggg gac atg ccg ttc tcc aac
ala pro asp gly val thr val thr met phe glu gly leu gly asp leu pro phe tyr asn
241/81                              271/91
gaa gac atc gac aca gag acg gag gtg cgc gcc ccg gtc agc cgc ttg cgg gag gcc ggc
glu asp ile asp thr ala thr glu val pro ala pro val ser ala leu arg glu ala ala
301/101                             331/111
tct gac ggc cac gct gcc ttg gtg gtc acc cgc gaa tcc aac ggc agc att ccg gcc gtg
ser asp ala his ala ala leu val val thr pro glu tyr asn gly ser ile pro ala val
361/121                             391/131
atc aag aac ggc atc gac tgg ctc tcc agc cca ttc gcc gat gcc ggc ttg aag gac aag
ile lys asn ala ile asp trp leu ser arg pro phe gly asp gly ala leu lys asp lys
421/141                             451/151
ccg ttg gcc gtg atc gcc gcc tcc atg gcc cgc tcc gcc ggg gta tgg ggc cac gac gag
pro leu ala val ile gly gly ser met gly atg tyr gly gly val trp ala his asp glu
481/161                             511/171
acc cgc aag tgc ttc agc atc gcc gcc acc cgc ggc gtc gtc gat gcc atc aaa ctc tgc ggc
thr arg lys ser phe ser ile ala gly thr arg val val asp ala ile lys leu ser val
541/181                             571/191
ccg ttc caa act ctc gcc aag tgc gtc gcc gac gac gcc ggc ctc ggc gcc aat gtg cgc
pro phe gin thr leu gly lys ser val ala asp asp ala gly leu ala ala asp val arg
601/201                             631/211
gac gcc gtc gcc aac ttg gcc gct gag gtc gcc tga
asp ala val gly asn leu ala ala glu val gly OPA

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SEQ ID N° 14P

FIGURE 14P

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fragment d'après la séquence publiée par Cole et al. (Nature 393:537-544) et contenant seq 14P' et seq 14P'

1/1 31/13
 caa cgc gat cgc aac aaa tgc gac cat ggt cgc gtt cgc tgc aag gac gtc gac caa
 OCH arg asp arg aac lys ser asp his gly pro val gly ser cys lys asp val asp gln
 aen ala ile gly ile aen arg thr met val arg leu ala arg ala arg thr trp thr aen
 thr arg ser gln OCH ile gly pro trp ser gly trp leu val gln gly arg gly thr thr
 61/21 91/31
 caa cgc gaa agg aac gta gca gtc tca gat acc aag tcc gac atc aaa atc ttc gcc tta
 gln ala glu arg aen val ala val ser asp thr lys ser asp ile lys ile leu ala leu
 lys arg lys gly thr AMB gln cys gln ile pro ser pro thr ser lys ser trp pro AMB
 ser gly lys glu arg ser ser val arg tyr gln val arg his gln aen leu gly leu ser
 121/41 151/51
 gtc gga agc ctg cgc gag gac tgc ttc aac cgc aag atc gcc gag ctg ggt gcc aag gtc
 val gly ser leu arg ala ala ser phe aen arg gln ile ala glu leu ala ala lys val
 trp glu ala cys ala arg arg arg ser thr ala arg ser pro ser trp leu pro arg ser
 gly lys pro ala arg gly val val gln pro pro asp arg arg ala gly cys gln gly arg
 181/61 211/71
 gct cgc gac ggc gtc acc gtc acc atg ttc gag ggc ctg ggc gac ctg cgc ttc tac aac
 ala pro asp gly val thr val thr met phe glu gly leu gly asp leu pro phe tyr aen
 leu arg thr ala ser pro ser pro cys ser arg gly trp gly thr cys arg ser thr thr
 ser gly arg arg his arg his his val arg gly ala gly gly pro ala val leu gln arg
 241/81 271/91
 gaa gac atc gac aca gag aac gag gtc cgc ggc cgc gtc aga gcc ttc cgc gag gcc gcc
 glu asp ile asp thr ala thr glu val pro ala pro val ser ala leu arg glu ala ala
 lys thr ser thr gln arg arg arg cys arg arg arg OPA ala arg cys gly arg pro arg
 arg his arg his ser asp gly gly ala gly ala gly glu arg val ala gly gly arg val
 301/101 331/111
 tct gac ggc cat gct gcc ttg gtc gtc aag cgc gaa tac aac ggc agc atc cgc gcc gtc
 ser asp ala his ala ala leu val val thr pro gln tyr aen gly ser ile pro ala val
 leu thr arg thr leu pro trp trp ser arg aen thr thr ala ala phe arg pro OPA
 OPA arg ala arg cys leu gly gly his ala gly ile gln arg gln his ser gly arg asp
 361/121 381/131
 atc aag aac gcg atc gac tgc ctg tcc agc cca ttc ggc gat ggc ttc aag gac aag
 ile lys aen ala ile asp trp leu ser arg pro phe gly asp gly ala leu lys asp lys
 ser arg thr arg ser thr gly cys pro gly his ser ala met ala arg OPA arg thr tcc
 gln glu arg asp arg leu ala val gln ala ile arg arg trp arg val glu gly gln ala
 421/141 451/151
 cgc ctg gcc gtc atc ggc gcc tcc atg ggc cgc tac ggc ggc gta tgc gcc vac gac gag
 pro leu ala val ile gly gly ser met gly arg tyr gly gly val trp ala his asp gln
 arg trp pro OPA ser ala ala pro trp ala ala thr ala gly tyr gly arg thr thr arg
 val gly arg asp arg arg leu his gly pro leu arg arg gly met gly ala arg arg asp
 481/161 511/171
 act cgc aag tgc ttc agc atc gct ggc aag cgc gtc gtc gat gcc atc aaa ctg tgc gtc
 thr arg lys ser phe ser ile ala gly thr arg val val asp ala ala lys leu ser val
 leu ala ser arg ser ala ser leu ala arg gly trp ser met arg ser aen cys arg cys
 ser gln val val gln his arg trp his ala gly gly arg cys asp gln thr val gly ala
 541/181 571/191
 cgc ttc caa acc ctg ggc aag tgc gtc ggc gac gcc gcc ggc ggc ggc gac gtc gcc
 pro phe gln thr leu gly lys ser val ala asp asp ala gly leu ala ala aen val arg
 arg ser lys leu trp ala ser arg ser arg thr thr pro gly trp arg arg met cys ala
 val pro aen ser gly gln val gly arg gly arg arg ala gly gly glu cys ala arg
 601/201 631/211
 gcc gcc gtc gcc aac tgc gcc gct gag gtc gcc tcc tcc atg gtc ggc gcc ggc tcc gcc
 asp ala val ala aen leu ala ala glu val gly OPA ser leu gly asp gly gly ser ala
 thr pro ser ala thr trp pro leu arg ser ala asp pro trp ala glu ala gly gln pro
 arg arg arg gln leu gly asp OPA gly arg leu ile pro gly pro arg arg val ser gln
 661/221 691/231
 aat agc ggc tcc atc gcc ttc gct ggt agc ggt tcc gcc ggc aac tag cgc gca gct gct
 aen ser gly ser ile gly phe ala gly ser gly ser ala gly ser AMB arg arg arg cys
 ile ala ala pro ser ala leu leu val ala val arg arg glu ala ser gly asp val val
 AMB arg leu his arg leu cys trp AMB arg phe gly gly lys leu ala ala thr leu ser

SEQ ID N° 14Q

FEUILLE DE REMPLACEMENT (REGLE 26)

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721/241 751/251
 cgg tgg cgg gtc ata tat tgg gcc aga cgg gta tgg cgg cgg ctg agg tga tct ggg aca
 arg trp pro val ile tyr trp val arg arg val trp arg arg leu arg opa ser ala thr
 gly gly arg opa tyr ile gly ser asp gly tyr gly gly opa gly asp leu arg his
 val ala gly asp ile leu gly gin thr gly met ala ala ala glu val ile cys asp thr
 751/261 811/271
 cgc cgc cgc ggt gct cga gcc agg ctt acc acc agg gas ttt cga aac tgt tat tca gaa
 arg arg arg gly ala arg ala arg leu thr thr arg glu phe arg lys cys tyr ser glu
 ala ala ala val leu glu pro gly leu arg pro gly asn phe glu asn val ile gin asn
 pro pro arg cys ser ser gin ala tyr asp gin gly ile ser lys met leu phe arg thr
 841/281 871/291
 cat ctt gta tct ctt ctc cgt gcc acc ccc tag gtc tag tgt tct cga gta cgg gca gat
 his leu val ser leu leu arg ala thr pro amb val amb cys phe arg val pro ala asp
 ile leu tyr leu phe ser val pro pro pro arg cys ser val phe glu tyr arg gin ile
 ser cys ile ser ser pro cys his pro leu gly val val phe ser ser thr gly arg ser
 901/301 931/311
 ccc agg ttc acc agg tct cag cag ata cac ggg ggg cga tga act tcc cgg cat cgg cat
 pro arg phe thr arg ser his gin ile his gly ala arg opa thr ser arg his arg his
 pro gly ser pro gly leu thr arg ser thr gly arg asp glu leu pro gly ile gly ile
 gin val his gin val ser pro asp pro arg gly ala met ser phe pro ala ser ala ser
 961/321 991/331
 cgc cag gtc gcc gga cgt ggt cgc ggt atg acc gga atc tga acc ctt gtc ggg cgc ctc
 arg gin val asp gly arg gly arg ala ser thr gly ile trp ser leu val gly pro leu
 ala arg ser thr asp val val ala leu opa arg glu ser gly ala leu ser gly arg ser
 pro gly arg arg thr trp ser arg tyr asp gly ser leu glu pro cys arg ala ala glu
 1021/341 1051/351
 aac ata tgg aag atg aac tac ktg agt cgt tgc aag atc ctc tca gat tcc cga ttt cgg
 asn ile ser lys met his tyr leu ser arg cys gin ile leu ser asp ser arg phe pro
 thr tyr arg arg cys thr thr opa val val ala arg ser cys gin ile pro asp phe arg
 his ile glu asp ala leu leu glu ser leu pro asp pro val arg phe pro ile ser ala
 1081/361 1111/371
 caa agg ago ggt acc ccc atg acc gtc acc gtt tac act aa
 gin arg ser gly thr pro met thr val thr val tyr thr
 lys gly ala val arg pro opa pro opa pro phe thr leu
 lys glu arg tyr ala his asp arg asp arg leu his och

SEQ ID N° 14Q(suite)

FIGURE 14Q(suite)

1/1 31/11
 caa gcc cgg cgg cga ctg ttt gcc gtt ttg ggg ctc cta cca gaa cac cac ctg ggg gcc
 gln ala arg pro arg leu phe ala val leu gly leu leu pro glu his his leu ala ala
 61/21 81/31
 cgc cac cat ggt ctg cac cag ttg cga tcc gtt cct ccc cgc cgc ggc cga cca cct
 ala his his gly val his gin leu arg ser val pro pcc ala arg gly arg arg arg
 121/41 151/51
 cga tgc cgc cgc cgc gcc gcc gca gct cgc tag ctc gac cgc gtc gac gac gac gtc
 arg cys pro arg pro gly gly ala ala ala amb leu asp pro val asp asp asp gly val
 181/61 211/71
 gcc gga cca gtc ggc gat gtc gag ggg atc gca ata cac ccc ctt ggt cgc cgc cca cac
 gly gly pro val gly asp val glu ala met ala ile gin arg leu gly ala arg pro his
 241/81 271/91
 gtc tga ggt gcc gaa gac cag tcc cgc gcc cag cgg cag cgc gat cgc gat acc cgc tac
 val opa gly gly glu asp gin ser arg ala his arg gin pro asp pro asp thr arg tyr

SEQ ID N° 15A

50/185

32/11
AAG CCC GGC CCG GAC TGT TTS CCG TTT TGG GGC TCC TAC CAG AAC ACC ACC TGG CCG CCS
lys pro gly arg asp cys leu pro phe trp gly ser tyr gln asn thr thr trp arg pro
62/21
CGC ACC ATG GTG TGC ACC ACT TGC GAT CCG TTC CTC CCG CSC GCG GGC GGC GAC GAC GTC
arg thr met val cys thr ser cys asp arg phe leu pro arg ala gly gly asp asp val
122/41
GAT GCC CCG GCC CCG GCG CCG CAG CTG CTT AGC TCG ACC CCG TCG ACG ACG ACG GCG TCG
asp ala arg ala pro ala ala gln leu arg ser ser thr arg ser thr thr gly ser
182/61
CGC GAC CAG TCG GCG ATG TCG AGG CGA TGG CAA TAC AGC GCC TTG GTG CCG GCG CAC ACG
ala asp gln ser ala met ser arg arg trp gln tyr ser ala leu val arg gly ala thr
242/81
TCT GAG GTG GCG AAG ACC AGT CCG GCG CCC ACC GCG ACC CCG ATC CCG ATA CCG GGT AC
ser glu val ala lys thr ser pro ala pro thr gly ser arg ile arg ile arg gly

SEQ ID N° 15B

FIGURE 15B

33/11
AGC CCG GCG CCG ACT GTT TGC CGT TTT GCG GCT GCT ACC AGA ACA CCA CCG GCG GCG CCG
ser pro ala ala thr val cys arg phe gly ala pro thr arg thr pro pro gly gly arg
63/21
GCA CCA TGG TGT GCA CCA GTT GCG ATC GGT TCC TCC CCG GCG CCG GCG GCG ACG ACG TCG
ala pro trp cys ala pro val ala ile gly ser ser arg ala arg ala ala thr thr ser
123/41
ATG GCC CCG CCG CCG CCG AGC TGC GTA GCT CCA CCG GGT CGA CCA CCA CCG GGT CCG
met pro ala pro arg arg arg ser cys val ala arg pro gly arg arg arg arg gly arg
183/61
CGC ACC ACT CCG CGA TGT CGA GGC GAT GGC AAT ACA GCG CCT TGG TGC GCG GCG ACA CGT
arg thr ser arg arg cys arg gly asp gly asn thr ala pro trp cys ala ala thr arg
243/81
CTG AGG TGG CGA AGA CCA GTC CCG CCG CGA CCG GCA GCG GGA TCG GGA TAC GCG GTA C
leu arg trp arg arg pro val pro arg pro pro ala ala gly ser gly tyr ala val

SEQ ID N° 15C

FIGURE 15C

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partie de la séquence nucléotidique de seq15A

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1/1                               31/11
GGC GGC GCG GCG CCA TGG TGT GCA CCA GTT GCG ATC GGT TGT GCG GCG GCG GCG GCG CCA
gly gly arg ala pro tsp cys ala pro val ala ile gly ser pro ala arg gly arg arg
61/21                               91/31
CGA CGT CGA TGG CCG GCG CCC GGC GGC TGC AGC TGC GTA GCT CGA CCG GGT CGA CGA CGA
arg arg arg tsp pro arg pro gly gly cys ser cys val ala arg pro gly arg arg arg
121/41                               151/51
CGG GGT GGG GGG GGC AST CGG CGA TGT CGA GCG GAT GCG AAT ACA GCG GGT TGG TGC GCG
arg gly arg arg ala ser arg arg cys arg gly asp gly asn thr ala pro trp cys ala
161/61                               211/71
GCC ACA GGT GTG AGG TGG CGA AGA CGA GTC CGC GCG CGA CCG GCA GCG GGA TC
ala thr arg leu arg tsp arg arg pro val pro arg pro pro ala ala gly

```

SEQ ID N° 15A'

FIGURE 15A'

```

1/1                               31/11
GGC GGC GCG GCG CAT GGT GTG CAC CAG TTG CGA TGG GTT CTC GCG GCG GCG GCG GCG GAC
ala ala ala arg his gly val his gln leu arg ser val leu pro arg ala gly gly asp
61/21                               91/31
GAC GTC GAT GCG GCG GCG GCG GGT GCA GGT GCG TAC CTC GAC CCG GTC GAC GAC GAC
asp val asp gly arg ala pro ala ala ala ala ala PMS leu asp pro val asp asp asp
121/41                               151/51
GGG GTC GCG GCG CCA GTC GCG GAT GTC GAG GCG ATC CCA ATA CAG GCG GTT GGT GCG GCG
gly val gly gly pro val gly asp val glu ala met ala ile gln arg leu gly ala arg
161/61                               211/71
CCA CAG GTC TGA GGT GCG GAA GAG CAG TCC CGC GTC CAG GCG CAG CCG GAT C
pro his val GPA gly gly glu asp gln ser arg ala his arg gln pro asp

```

SEQ ID N° 15B'

FIGURE 15B'

```

1/1                               31/11
TGC GCG GCG GCG GCG AAG GTG TCG ACC AGT TCG GAT GCG TTC TCG GCG GCG GCG GCG
trp arg pro arg ala met val cys thr ser ser cys asp arg phe ser arg ala arg ala ala
61/21                               91/31
ACG ACG TCG ACG GCG GCG CCG GCG GCG GTG CAG CTC GGT AGC TCG ACC GCG TCG ACG ACG
thr thr ser met ala ala pro arg arg leu glu leu arg ser ser thr arg ser thr thr
121/41                               151/51
ACG GCG TCG GCG GCG CAG TCG GCG ATG TCG AGC CGA TCG CAG TAC AGC GCG TCG GTG GCG
thr gly ser ala gly gln ser ala met ser arg arg tsp glu thr ser ala leu val arg
161/61                               211/71
GCG CAG ACG TGT GAG GTG GCG AAG ACC AGT GCG GCG CCG ACC GCG ACG GCG ATC
gly his thr ser glu val ala lys thr ser pro ala pro thr gly ser arg ile

```

SEQ ID N° 15C'

FEUILLE DE REMPLACEMENT (REGLE 26)

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ORF contenant Seq15A d'après Cole et al. (Nature 393:537-544)

```

1/1                               31/11
taa ggt cag cca acc att tac gct cga cgg cag cca aga ggt ggc cag cca ctt tca gcc
ccn gly pro pro thr leu tyr ala arg arg pro pro arg val gly arg pro leu ser gly
61/21                               61/31
cgt agt cgc cgc agg gca ggg att ccc ggc tgc tct tgg cgg gtt tgt cgg caa agc tgt
arg ser arg arg arg ala gly leu pro ala ser ser ser arg val cys arg gln arg cys
121/41                               151/51
agg ggt agc gct cgt ggg cgt cga cga cga tct gcc gct cgg gaa tgc cgg cgg cgt ggg
arg gly ser val arg gly arg arg arg arg cys ala ala arg gly cys arg arg arg gly
161/61                               211/71
cgg cgg ggg tgc gca cgc ccg gcc ggc act gtt tgc ggc tct tgg ggc tct gcc aga cca
arg trp gly cys ala arg pro ala ala thr val cys ala phe trp gly ser ala arg thr
241/81                               271/91
cca cct gcc gcc cgc gcc cca tgg tgt gca cca gtt ggc acc ggt tct ccc gcc cgc gcc
pro pro gly gly arg ala pro trp cys ala pro val ala ile gly ser pro ala arg gly
301/101                               331/111
cgg cga cga cgt cga tgg ccg cgc ccc gcc gcc tgc acc tgc gta gct cga ccc ggt cga
arg arg arg arg arg trp pro arg pro gly gly cys ser cys val ala arg pro gly arg
361/121                               391/131
aga cga cgg ggt cgg cgg gcc agt cgg cga tct ccc gcc gct gcc aat acc gcc cct tgg
arg arg arg gly arg arg ala ser arg arg cys arg gly asp gly acc thr ala pro trp
421/141                               451/151
tgc gcc gcc acc cgt cgg agg tgg cga aga cca gcc ccg cgc ccc ccg gca gcc gga tca
cys ala ala thr arg leu arg trp arg arg pro val pro arg pro pro ala ala gly ser
481/161                               511/171
ggc agc gca gcc gcc agt ctt cag cgg ggt tgg cgg cga cga gca gct cca cag agt ggc
gly arg ala gly ala ser leu gln arg gly trp arg arg arg ala ala pro gln ser val
541/181                               571/191
agg gca cgg gcc gcc tac gcc aac ggt cag cca gcc act cgg acc aac cca tgc tca cgc
arg val arg ala ala tyr gly asn gly glu ala gly thr pro thr asn pro ser ser arg
601/201
cga agg gcc agg tga
arg arg gly arg ORF

```

SEQ ID N° 15F

FIGURE 15F

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R:RV2530c prédite d'après Cole et al. (Nature 393:537-544) et pouvant être en phase avec SEQ15A

```

1/1 31/11
gtg acg gca ctg ctg gat gtc aat gtg ctg acg gag ctg ggc cgg aat cac gtt cac
val thr ala leu leu asp val asn val leu ile ala leu gly trp pro asn his val his
61/21 91/31
cat ggc gcc ggc cag cga tgg ttc aag cag ttc tcc tcc aat ggg tgg gcc acc aag cgg
his ala ala ala gln arg trp phe thr gln phe ser ser asn gly trp ala thr thr pro
121/41 151/51
atc acc gag gca ggg tat gtc cga att tca agc aat cgc agt gtg atg cag gtg bog acc
ile thr glu ala gly tyr val arg ile ser ser asn arg ser val met gln val ser thr
181/61 211/71
acg cgg gct atc ggc atc gct cag ttg ggc ggc atg act tct cct gcc ggg cac aag ttt
thr pro ala ile ala ile ala gln leu ala ala met thr ser leu ala gly his thr phe
241/81 271/91
egg cct gac gat gtg cca ctg atc gtt ggg agc gcc ggc gat cgc gat cgc gtg tcc aac
trp pro asp asp val pro leu ile val gly ser ala gly asp arg asp ala val ser asn
301/101 331/111
cac cgt cgg gtc acc gac tgc cat ttc atc gcc ttg gcc cgc cgc tac cgg gcc cgc ttg
his arg arg val thr asp cys his leu ile ala leu ala ala arg tyr gly gly arg leu
361/121 391/131
gtc aca ttc gat gcc gca ctg gcc gat tca gca tcc gca ggc ctc gtr gag gtg ttg tag
val thr phe asp ala ala leu ala asp ser ala ser ala gly leu val glu val leu ANB

```

SEQ ID N° 15R

FIGURE 15R

Seq15P: ORF d'après Cole et al. (Nature 393:537-544) contenant RV2530c

```

1/1 31/11
tga tgt tcc gcc gga tgc gcc gac ggt gac ttc cga gga tgt cgt ctg cgc gcc cga gga
cga cys ser ala gly cys ala asp gly asp phe arg gly cys arg pro arg ala arg gly
61/21 91/31
cga cgt gtg acc gca ctg ctg gat gtc aat gtc ctg atc ggc cgt cgc ggc cgc aat cac
arg arg val thr ala leu leu asp val asn val leu ile ala leu gly trp pro asn his
121/41 151/51
gtt cac cat ggc gcc ggc cag cga tgg ttc aag cag ttc tcc tcc aat ggg tgg gcc acc
val his his ala ala ala gln arg trp phe thr gln phe ser ser asn gly trp ala thr
181/61 211/71
acg cgg atc acc gag gca ggg tat gtc cga att tca agc aat cgc agt gtg atg cag ggc
thr pro ile thr gln ala gly tyr val arg ile ser ser asn arg ser val met gln val
241/81 271/91
cgc acc acg cgc gcc acc gcc atc gct cag ttg ggc ggc arg act tct cct gcc ggc cac
ser thr thr pro ala ile ala ile ala gln leu ala ala met thr ser leu ala gly his
301/101 331/111
acg ttt tgg ccc gac gat gtg cca ctg atc gtc ggg agc gcc gcc gat cgc gcc gcy gtg
thr phe trp pro asp asp val pro leu ile val gly ser ala gly asp arg asp ala val
361/121 391/131
tcc aac cac cgt cgg gtc acc gac tgc met ttc atc gcc ttg gcc ggc cgc tac gga gcc
ser asn his arg arg val thr asp cys his leu ile ala leu ala ala arg tyr gly gly
421/141 451/151
cgg ttg gcc aca ttc gat gcc gca ctg gcc gat tca gca tcc gca ggc ctc gtr gag ggc
arg leu val thr phe asp ala ala leu ala asp ser ala ser ala gly leu val glu val
481/161
ctg ttg
leu ANB

```

SEQ ID N° 15P

FEUILLE DE REMPLACEMENT (REGLÉ 26)

FIGURE 15P

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Fragment contenant Seq15P' et Seq 15P''

1/1 31/11
 tga tgt tcc gcc gga tgc gcc gac ggt gac ttc cga gga tgt cgt ccg cgc gct cga gga
 CPA cys ser ala gly cys ala asp gly asp phe arg gly cys arg pro arg ala arg gly
 asp val pro pro asp ala pro thr val thr ser glu asp val val arg ala leu glu asp
 Met phe arg arg met arg arg CPA leu pro arg met ser ala arg ser arg thr
 61/21 91/31
 cga cgt cgc acg gcc ctg ctc gat gtc atc ggc atg ggc tgg ccg aac cac
 arg arg val thr ala leu leu asp val aac val leu ile ala leu gly trp pro aac his
 asp val CPA arg his cys ser met ser met cys CPA ser arg trp ala gly arg ile thr
 thr cys asp gly thr ala arg cys gln cys ala asp arg ala gly leu ala glu ser arg
 121/41 151/51
 gtt cac cac ggc gcc ggc cag cga tgg ttc acg cag ttc tcc tcc aat ggc cga gcc aac
 val his his ala ala ala gln arg trp phe thr gln phe ser ser aac glt trp ala thr
 phe thr met arg pro arg ser asp gly ser arg ser ser pro arg met gly gly pro pro
 ser pro cys gly arg ala ala met val his ala val leu leu glu trp val gly his his
 181/61 211/71
 acg cgg atc acc gag gcc ggc tat gtc cga att hca agc aat cgc cgt ggc atg cag ggc
 thr pro ile thr glu ala gly tyr val arg ile ser ser aac arg ser val met gln val
 arg arg ser pro arg gln gly met ser glu phe gln ala ile ala val CPA cys arg cys
 ala asp his arg gly arg val cys pro aac phe lys gln ser gln cys asp ala gly val
 241/81 271/91
 tgg acc acg cgc gct atc cgc atc gct cag ttg gcc gcc aac met ser ctt gcc ggc cac
 ser thr thr pro ala ile ala ile ala gln leu ala ala met thr ser leu ala gly his
 arg pro arg arg leu ser arg ser leu ser trp arg arg CPA leu leu leu pro gly thr
 asp his ala gly tyr arg asp arg ser val gly asp asp phe ser cys arg ala his
 301/101 331/111
 acg ttr tgg ccc gac gat gtc cca ctg atc gtt gcc agc gcc gcc gct tgg ccg aac cac
 thr phe trp pro asp asp val pro leu ile val gly ser ala gly asp arg ala val
 arg phe gly leu thr met cys his CPA ser leu gly ala pro ala ile ala met arg cys
 val leu ala CPA arg cys ala thr asp arg trp glu arg arg arg ser arg cys gly val
 361/121 391/131
 gcc aac ccc cys ccg gtc aac gac tgc cat ctc atc gcc tgg gcc gcc cgc tac gcc gcc
 ser aac his arg arg val thr asp cys his leu ile ala leu ala ala arg tyr gly gly
 pro thr thr val gly ser pro thr ala ile ser ser pro trp pro arg ala thr gly ala
 gln pro pro ser gly his arg leu pro ser his arg leu gly arg ala leu arg gly pro
 421/141 451/151
 cgg tgc gtc aac ttc gat gcc gcc ctg gcc gat tca gca tcc gca gcc ctc gcc gag ggc
 arg leu val thr phe asp ala ala leu ala asp ser ala ser ala gly leu val glu val
 gly trp ser his ser met pro his trp pro ile gln his pro glu ala ser ser arg cys
 val gly his ala arg cys arg thr gly arg phe ser ile arg arg pro arg arg gly val
 481/161 511/171
 ctg tag tca ccg gcc atg gcc gcc tgg cca gcc ctg cag gat ctg cgc gcc cag gcc ccc
 leu aac ser pro gly met gly gly ser pro gly leu gln asp leu arg ala gln ala pro
 cys ser his arg gly trp ala ala arg gln ala cys arg ile cys gly arg arg pro
 val val thr gly asp gly arg leu ala arg pro ala gly ser ala gly ala gly ala pro
 541/181 571/191
 ccg cgt gga ccc cgg cag gcc gat ttc gcc cca cgt gcc cgc ctc gcc gcc gct gcc
 pro val gly his arg gly ala asp ala phe gly pro arg ala gln leu gly ala ala gly
 arg ser asp thr gly arg pro thr leu ala his ala arg ser ser ala leu leu gly
 gly arg thr pro ala gly arg arg phe trp pro thr arg ala ala arg arg cys trp ala
 601/201 631/211
 ctc gcc ctc gcc gcc gcc ctc gcc aac cgt ggt gcc gtc gcc atc gcc gac gcc aac
 leu gly leu gly gly ser arg leu glu aac arg gly gly val gly ile val asp glu pro
 ser gly ser ala ala ala gly ser lys thr val val ala ser ala ser ser thr aac gln
 arg ala arg arg gln pro ala arg lys pro trp trp arg arg his arg arg arg thr arg

SEQ ID N° 15Q

FIGURE 15Q

FEUILLE DE REMPLACEMENT (REGLE 26)

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681/231 691/231
 ggt ggc ggc ggc tag ata gcg gta ggc gta ttc ctg ggc gag att gcg ggt tta gca
 gly glu gly gly gly ams ale ala val gly val phe leu gly glu leu ala gly leu ala
 val arg ala ala arg ams arg ams val tyr ser trp ala ser leu arg val trp gin
 oca gly arg arg leu asp ser gly arg cys ile pro gly arg ala cys gly phe gly arg
 723/241 781/251
 gaa cac gat cgg cac gtt ggc aaa gcc gat ctg caa ttc ggc cag ccc atc ggc gat cgc
 glu his asp arg his val gly lys ala asp leu gin phe gly gin pro ile gly asp arg
 ser thr ile gly thr leu gly lys pro ile cys aas ser ala ser pro ser ala ile ala
 thr arg ser ala arg trp glu ser arg ser ala ile arg pro ala his arg arg ser pro
 781/251 811/271
 cgt cgg ggc ggc gaa gga gtc ggc gaa gat ctg cga gta ggc gtc ctc gac cac cac ggc
 arg arg ala gly glu gly val arg glu asp leu arg val ala val leu asp his his gly
 val gly arg ala lys glu cys ala lys ile ser glu ams arg ser ser thr thr thr ala
 ser gly gly arg arg ser ala arg arg ser pro ser ser gly pro arg pro pro arg arg
 841/281 871/291
 ggc cgt tgg cag cgc ggc cag ttc ggt cag ctg gta ttt cag gta gcc gtt cad cac gcc
 gly pro trp gin arg gly gin phe gly gin leu val phe gin val ala val gin his ala
 ala arg gly ser ala ala ser ser val ser trp tyr pro arg leu pro phe ser thr pro
 pro val ala ala arg pro val arg ser val gly ile ser gly cys arg ser ala arg gin
 901/301 931/311
 aga agt aag gtc cgc caa cgc ttt acc ctg gac ggc ggc cac gag tgg gcc ggc cac ttt
 arg ser lys val arg gin arg phe thr leu asp gly arg his glu leu ala gly his phe
 glu val arg ser ala aas ala leu arg ser thr ala ala thr ser trp pro ala thr phe
 lys oca gly pro pro thr leu tyr ala arg arg pro pro arg val gly arg pro leu ser
 961/321 991/331
 cag gcc gta gtc gcc gca ggc cag gcc ttc cgc cgt cgt ctt cgc ggc ttt gtc gcc aas
 gin ala val val ala ala gly gin gly phe pro arg arg leu arg gly phe val gly lys
 arg pro ams ser pro gin gly arg ala ser arg val val phe ala gly leu ser ala lys
 gly arg ser arg arg ala gly leu pro ala ser ser arg val cys arg gin arg
 1021/341 1051/351
 ggt gta ggc gta ggc ttc ggc gcc gtc gac gcc gat ctg cag ctc ggc gat gcc gcc gcc
 gly val gly val ala phe val gly val asp asp asp val gin leu gly asp ala gly gly
 val ams gly ams arg ser trp ala ser thr thr met cys ser ser gly met pro ala ala
 cys arg gly ser val arg gly arg arg arg arg cys ala ala arg gly cys arg arg arg
 1081/361 1111/371
 ggc ggc ggt ggc ggt ggc cac gcc cgc cgc cga atg ttt ggc cgt ttt ggc gct ctg cca
 ala gly gly gly ala his ala arg pro arg leu phe ala arg phe gly ala let pro
 arg ala val gly val arg thr pro gly arg asp cgc leu arg val leu gly leu cys gin
 gly arg trp gly cys ala arg pro ala ala thr val cys ala phe trp gly ser ala cgc
 1141/381 1171/391
 gaa cac cac cgc ggc gcc ggc cgc gat ggt gtc cac cag ttg cga tgg gtc ntc cgc cgc
 glu his his leu ala ala ala arg his gly val his gin leu arg ser val leu pro arg
 ser thr thr trp arg pro arg ala met val cys thr ser cys asp arg phe ser arg ala
 thr pro pro gly gly arg ala pro trp cys ala pro val ala ile gly ser pro ala arg
 1201/401 1231/411
 ggc ggc gcc gac gac gtc gat gcc cgc gcc cgc ggc ggt gaa gat ggc tag ctc gac cgc
 ala gly gly asp val asp gly arg ala pro ala ala ala ala ams leu asp pro
 arg ala ala thr thr ser met ala ala pro arg arg leu gin leu arg ser ser thr arg
 gly arg arg arg arg trp pro arg pro gly gly cys ser cys val ala arg pro gly
 1261/421 1291/431
 gtc gac gac gac ggc gtc ggc ggc cca gtc gcc ggt gtc cag gcc atg gcc ala cag cgc
 val asp asp asp gly val gly gly pro val gly asp val gin ala met ala ile gin arg
 ser thr thr thr gly ser ala gly gin ser ala met ser arg arg trp gin tyr ser ala
 arg arg arg arg gly arg arg ala ser arg arg cys arg gly asp gly aas thr ala pro

SEQ ID N° 150 (suite 1)

FIGURE 150 (suite 1)

56/185

1321/441 1361/451
 ctt ggt ggg cgg cca cac gtc tga ggt ggc gaa gac cag tcc cgc ggc cac cgg cag cgg
 leu gly ala arg pro his val opa gly gly glu asp gln ser arg ala his arg gln pro
 leu val arg gly his thr ser glu val ala lys thr ser pro ala pro thr gly ser arg
 trp cys ala ala thr arg leu arg trp arg arg pro val pro arg pro pro ala ala gly
 1391/461 1411/471
 gat cag gta ggg cag ggg cga gtc ttc agc ggg gtt ggc ggc gac gag cag ctc cac aga
 asp gln val gly gln ala arg val phe ser gly val gly gly asp glu gln leu his arg
 ile arg amh gly arg arg glu ser ser ala gly leu ala ala thr ser ser ser thr glu
 ser gly arg ala gly ala ser leu gln arg gly trp arg arg ala ala pro gln ser
 1441/481 1471/491
 gtg tga ggg tac ggg cgg cgt cgc gaa agt gtc agt cag gca ctc cga cga acc cat cys
 val opa gly tyr gly arg arg thr ala thr val lys gln ala leu atp arg thr his arg
 cys glu gly thr gly gly val arg gln arg opa ser arg his ser asp glu pro ile val
 val arg val arg ala ala tyr gly asn gly glu ala gly thr pro thr asn pro ser ser
 1501/501
 cac gtc gaa ggg gca ggt gc
 his val glu gly ala gly
 thr ser lys gly gln val
 arg arg arg gly arg opa

SEQ ID N° 15Q (suite 2)

FIGURE 15Q (suite (2))

151/11
 tgc gca tgc cga cca cgc tgc ttc ggc gca gtt cct ttc ttc ggc att gcc tca acc att
 cys ala cys arg pro val trp leu ala gly val arg leu phe ala ile ala ser thr ile
 161/21 171/31
 cga tat aac cac tct agt cac atc aac cac act cgt acc att gaa cct gtc ggt tga tcc
 arg tyr asn his ser ser his ile asn his thr arg thr ile glu arg val gly ser cys
 171/41 181/51
 cat gca ttc cgc acc cgc gca gcc gcc gaa ccc gcc gcc aca cat aat cca gat tga cga
 his ala phe ala thr ala gly ala gly gln pro gly ala thr his asn pro asp opa gly
 181/61 191/71
 gac ttc cgt gcc gaa cgc acg cgc acc caa gct ttc gac agc cat gag cgc ggt cgc gcc
 asp phe arg ala glu pro thr pro thr gln ala phe asp ser his glu arg gly arg arg
 201/81 211/91
 cct gcc agt tgc aag tcc ttg tgc ata ttt tct tct cta cga atc aac cga aac gac cga
 pro gly ser cys lys ser leu cys ile phe ser cys leu arg ile asn arg asn asp arg
 211/101 221/111
 cgc gcc cga cca cca tga att caa cca gcc gcc gct gtt gac cga cct gcc cgc cga gct
 ala ala arg ala pro opa ile ala ala gly gly gly val asp arg pro ala arg arg ala
 221/121 231/131
 gat gtc cgc gct atc cca gcc gct gtc cca gtt cgc gat c
 asp val arg ala ile ala gly val val pro val arg asp

SEQ ID N° 16A

FIGURE 16A

57/185

42/11
 GCG CAT GCC GAC CAG TGT GGT TCG CCG GAG TTC GTT TGT TCG CGA TTG CCT CAA CGA TTC
 ala his ala asp gln cys gly trp pro glu phe val cys ser arg leu pro gln arg phe
 62/21
 GAT ATA ACC ACT CTA CTC ACA TCA ACC ACA CTC GTA CGA TCG AGC GTG TGG GTT CAT GCC
 asp ile thr thr leu val thr ser thr thr leu val pro ser ser val trp val his ala
 122/41
 ATG CAT TCG CGA CCG CCG GAG CCG GCG AAC CCG GCG CGA CAC ATA ATC CAG ATT GAG GAG
 met his ser arg pro arg glu pro ala asn pro ala pro his ile ile gln ile gln glu
 182/51
 ACT TCC GTG CCG AAC CGA CCG CGA CGC AAG CTT TCG ACA GCG ATG AGC GCG GTC GCG GUC
 thr ser val pro asp arg arg arg arg lys leu ser thr ala met ser ala val ala ala
 242/81
 CTG GCA GTT GGA AGT CCT TGT GCA TAT TTT CTT GTC TAC GAA TCA ACC GAA AGC ACC GAG
 leu ala val ala ser pro cys ala tyc phe leu val tyr glu ser thr glu thr thr glu
 302/101
 CCG CCG GAG CAC CAT GAA TTC AAG CAG GCG GCG GTC TTG ACC GAG CTG CCC GCG GAG GTG
 arg pro glu his his glu phe lys gln ala ala val leu thr asp leu pro gly glu leu
 362/121
 ATG TCG GCG CTA TCG GAG GGG TTG TCC CAG TCC GGG ATC
 met ser ala leu ser gln gly leu ser gln phe gly ile

SEQ ID N° 16B

FIGURE 16B

33/11
 GCG ATG CCG ACC AGT GTG GTT GGC CCG AGT TCG TTT GTT CGC GAT TCG CTC AAC GAT TCG
 arg met pro thr ser val val gly arg ser ser phe val arg asp cys leu asn asp ser
 63/31
 ATA TAA CCA CTC TAG TCA CAT CAA CCA CAC TCG TAC CAT CGA GCG TGT GCG TTC ATG CGA
 ile CCA pro leu AMB ser his gln pro his ser tyr his arg ala cys gly phe met pro
 123/61
 TCG ATT CCG GAC CCG GGG AGC CCG CGA ACC CCG CCG CAC ACA TAA TCC AGA TTG AGG AGA
 cys ile arg asp arg gly ser arg arg thr arg arg his thr GCH ser arg leu arg arg
 183/61
 GTT CCG TCG CGA ACC GAC GCG GAC GCA AGC TTT CGA CAG CGA TGA CCG CCG TCG GCG CCC
 leu pro cys arg thr asp ala asp ala ser phe arg gln pro CGA ala arg ser pro pro
 243/81
 TCG CAG TTS CAA CTC GTT GTG CAT ATT TTC TTT ACC AAT CAA CCG AAA CGA CCG AGC
 trp gln leu gln val leu val his ile phe leu ser thr asn gln phe lys arg pro ser
 303/101
 GCG CCG AGC ACC ATG AAT TCA ACC AGC CCG CCG TGT TGA CCG ACC TCG CCG GCG AGC TGA
 gly pro ser thr met asn ser ser arg arg arg GFA pro thr cys pro ala ser GFA
 363/121
 TGT CCG CCG TAT CCG AGG GGT TGT CCG AGT TCG GGA TC
 cys pro arg cys arg arg gly cys pro ser ser gly

SEQ ID N° 16C

FIGURE 16C

FEUILLE DE REMPLACEMENT (REGLE 26)

58/185

31/11
 GCG GCG CAC CGA TCA GTC GAT CGG GTG GTT TCC GCT CCA TCA GCC CGG AAT TGA GGT GCG
 ala gly his arg ser val asp arg val val ser ala pro ser ala arg asn opa gly ala
 61/21
 GCA GTG ACC ACA CCA GCG CAG GAC GCG CGG TTG GTG TTT CCC TCT GTT GCT TTC GCG TCC
 ala val thr thr pro ala gln asp ala pro leu val phe pro ser val ala phe pro ser
 121/41
 GGC TCG CCT TTT TTT CAT CAA GGT TGG ACT GCG GCA GTG GCG ATG TTG CTC GCG GCG GTG
 gly ser pro phe phe his gln asg trp thr ala ala val ala met leu val ala gly val
 181/61
 TTC GGT CAC CTG ACG GTC GGG ATG TTC GTT GCG TCT CGG GTT GCT GGT GGT TTT GCT CAA
 phe gly his leu thr val gly met phe leu gly ser arg val ala ala gly phe ala gln
 241/81
 TGC CTC GCT GGT GCG GCG TTC GCG CGA GTC CAT CAC GCG CAA AGA GCA CCC GTT AAA ACC
 cys pro ala gly ala ala phe gly arg val asp his arg gln arg ala pro val lys thr
 301/101
 GTC GAT GCG CCT CAA CTC GGC ATC GCG ACT GCG GAT TAT CAC CAT GCG TCG GCG TGA TC
 val asp gly pro gln leu gly ile ala thr gly asp tyr his his ala ser gly opa

SEQ ID N° 17A

FIGURE 17A

32/11
 GCG GCG ACC GAT CAC TCG ATC GCG TCG TTT GCG CTC CAT CAG CCC GGA ATT GAG GTG GCG
 arg ala thr asp gln ser ile gly trp phe pro leu his gln pro gly ile glu val pro
 62/21
 CAG TGA CGA CAC CAG GCG AGG ACG GCG GGT TGG TGT TTC GCT CTG TTG CTT TCC CGT CCG
 gln opa arg his gln arg arg thr arg arg trp cys phe pro leu leu leu ser arg pro
 122/41
 GCT CGG CTT TTT TTC ATC AAC GTT GGA CTG CCG CAG TGG CGA TGT TGG TCG GCG GCG TGT
 ala arg leu phe phe ile asn val gly leu pro gln trp arg cys trp ser pro ala cys
 182/61
 TCG CTC ACC TGA CCG TCG GGA TGT TCC TTG GGT CTC GCG TTG CTG CTG GGT TTG CTC AAT
 ser val thr opa arg ser gly cys ser leu gly leu gly leu leu leu gly leu leu asn
 242/81
 GCG CTG CTG GTG CCG GGT TCG GCG GAG TCG ATC ACC GCG AAA GAG CAC CCG TTA AAA CCG
 ala leu leu val arg arg ser ala glu ser ile thr ala lys glu his pro leu lys arg
 302/101
 TGG ATG GCG CTC AAC TCG GCA TCG CGA CTG GCG ATT ATC ACC ATG CTT CCG GCT GAT C
 ser met ala leu asn ser ala ser arg leu ala ile ile thr met pro arg ala asp

SEQ ID N° 17B

FIGURE 17B

59/185

33/11
 GGG CCA CCG ATC AGT CGA TCG GGT GGT TTC CCG TCC ATC AGC CCG GAA TTG AGG TCC CCG
 gly pro pro ile ser arg ser gly gly phe arg ser ile ser pro glu leu arg cys arg
 63/21
 AGT GAC GAC ACC AGC GCA GGA CGC GGC GTT GGT GTT TCC CTC TGT TGC TTT CCG GTC CCG
 ser asp asp thr ser ala gly arg ala val gly val ser leu cys cys phe pro val arg
 123/41
 CTC GGC TTT TTT TCA TCA ACC TTG GAC TGC CCG AGT GGC GAT GTT GGT CCG CCG GGT GTT
 leu ala phe phe ser ser thr leu asp cys arg ser gly asp val gly arg arg arg val
 183/61
 CCG TCA CCT GAC GGT CCG GAT GTT CCT TGG GTC TCG GGT TGC TGC TGG GTT TGC TCA ATG
 arg ser pro asp gly arg asp val pro trp val ser gly cys cys trp val cys ser met
 243/81
 CCC TGC TGG TGC GGC GTT CCG CCG AGT CCA TCA CCG CCA AAG AGC ACC COT TAA AAC GGT
 pro cys trp cys gly val arg pro ser arg ser pro pro lys ser thr arg CCH asn gly
 303/101
 CGA TGG GGC TCA ACT CCG CAT CCG GAC TGG CGA TTA TCA CCA TGC CTC GGG CTG ATC
 arg trp pro ser thr arg his arg asp trp arg leu ser pro cys leu gly leu ile

SEQ ID N° 17C

FIGURE 17C

partie de la séquence nucléotidique de seq17A

1/1 31/11
 ggc tag aac acc gaa gga gac ctc gcc ggt tcc cgg acc cgg gcc cat cgg atg cgt atc
 gly mmh asn pro glu gly asp leu ala gly cys arg pro pro ala his arg met arg ile
 61/21
 cgg tgc cgc cga ttc acc acc gac ata ggc agt tcc ccc tgg ggt gat tcc ggt gcc acc
 arg ser arg arg phe thr thr asp ile gly ser cys pro leu gly asp ser gly ala thr
 121/41
 act gcc ata ggc tgg gcc gcc ccc cga tcc gtc ggt cgg gtc gtc tcc gct cca tcc gcc
 thr ala ile arg ser ala gly his arg ser val asp arg val val ser ala pro ser ala
 181/61
 cgg aat tga ggt gcc gaa gtg acc aca ccc gcc cag aac gcc cgg atg gtc tcc acc tcc
 arg asn cpa gly ala ala val thr thr pro ala gln asp ala pro leu val phe pro ser
 241/81
 gtt gct ttc cgt ccc ggt acc ctt ttt tcc aac aac gtt gga ctg gcc gca gtc gcc atg
 val ala phe arg pro val arg leu phe phe ile asn val gly leu ala ala val ala met
 301/101
 ctg gtc gcc gcc gtc ttc ggt ccc cgg acc gtc gcc atg ttc arg ggt ccc gcc ctg cgg
 leu val ala gly val phe gly his leu thr val gly met phe leu gly leu gly leu leu
 361/121
 cgg ggt ttg ctc aat gcc ctg ctg gtc cgg ggt tcc acc gag tgg atc acc gcc aac ggg
 leu gly leu leu asn ala leu leu val arg arg ser ala glu ser ala thr ala lys glu
 421/141
 aac ccc cta aac cgg cgg atg gcc ccc aac tcc gca tcc cga cgg ggg atc atc acc aac
 his pro leu lys arg ser met ala leu asn acc ala thr arg leu ala ala ile ile thr ile
 481/161
 ccc ggg cgg atc
 leu gly leu ile

SEQ ID N° 17A*

FIGURE 17A*

FEUILLE DE REMPLACEMENT (REGLE 26)

60/185

1/1 31/11
 gct aga acc cag aag gag acc tgg cgg gtt gcc ggc ccc cgg acc atc gga tgc gta tcc
 ala arg thr pro lys glu thr ser arg val ala gly pro arg pro ile gly cys val ser
 61/21 91/31
 ggt cgc gcc gat tca cga cag aca tag gga gct acc cct tgg gtg atc cgg ggc cga cga
 gly arg ala asp ser arg pro thr amh gly ala thr pro trp val ile pro val arg arg
 121/41 151/51
 ctc gga tac gct cgg cgg gcc acc gat cag tgc atc ggg tgg ttc cgg ctc cgt cag ccc
 leu arg tyr ala arg arg ala thr asp gln ser ile gly trp phe pro leu his gln pro
 181/61 211/71
 gga att gag gty cgg cag tga cga aac cag cgc agg arg cgc cgt tgg tgt tcc acc ctc
 gly ile glu val pro gln opa arg his gln arg arg thr arg arg trp cys phe pro leu
 241/81 271/91
 tgg ctt tcc gtc cgg ttc gcc ttt ttt tca tca acg tgg gac cgg cgc cag tgc cga tgt
 leu leu ser val arg phe ala phe phe ser ser thr leu asp trp pro gln trp arg cys
 301/101 331/111
 tgg tgg cgg ggg tat tgg gtc acc tga cgg tgg gga tgt tat tgg gtc tgg ggt tgc tgc
 trp ser pro ala cys ser val thr opa arg ser gly cys ser trp val ser gly cys cys
 361/121 391/131
 tgg gtt tgc tca atg ccc tgc tgg tgc ggc gtt cgg cag agt cga tca cgg cca aag agc
 trp val cys ser met pro cys trp cys gly val arg pro ser arg ser pro pro lys ser
 421/141 451/151
 acc cgt tca aac ggt cga tgg acc tca act cgg cat cgc gac tgg cga tta tta cca tcc
 thr arg cch asn gly arg trp pro ser thr arg his arg asp trp arg leu ser pro ser
 481/161
 tgg ggc tga to
 ser gly opa

SEQ ID N° 17B'

FIGURE 17B'

1/1 31/11
 cta gaa ccc cga agy aga acc cgc ggg tgg cgg ggc ccc ggc cca tgg gat ggc tat cgg
 leu glu pro arg arg arg pro arg gly leu pro ala pro gly pro ser asp ala tyr pro
 61/21 91/31
 gtc cgc cgc att cat gao cga cat agy gag tta ccc ctt ggg tga ttc cgg tgc gac gat
 val ala pro ile his asp arg his arg glu leu pro leu gly opa phe arg cys asp ala
 121/41 151/51
 tgc gat aag cta ggc cgg cca cgg atc agt cga tgg ggt ggc ttc cgc tcc atc agc cgg
 cys asp thr leu gly gly pro pro ile ser arg sec gly gly phe arg ser ile ser pro
 181/61 211/71
 gaa tgg agy tgc cgc agt gac gac acc agc gca gga ccc gcc gtt ggt gtt tcc ctc tgc
 glu leu arg cys arg ser asp asp thr ser ala gly arg ala val gly val ser leu cys
 241/81 271/91
 tgc ctt cgg tcc ggt tgg ctt tct ttt acc caa cgc tgg act ggc cgc agt ggc gat ggt
 cys phe gxo ser gly sec pro phe phe his gln arg trp thr gly arg ser gly asp val
 301/101 331/111
 ggt agc cgg ggt gtc cgg tca tcc gac gct cgg gat gtt ctt ggg tct cgg gtt ggt ggt
 gly arg arg arg val arg ser pro asp gly arg asp val tgg gly ser arg val ala ala
 361/121 391/131
 ggg ttt gct caa tgc cat gct ggt ggc ggc ttc ggc cga gtc gat ccc cgc caa aga gca
 gly phe ala gln cys pro ala gly ala ala phe gly arg val asp his arg gln arg ala
 421/141 451/151
 ccc gtt asa agy gta gac ggc cat caa ccc ggc atc cgg act ggc gat tat acc cat cct
 ptc val lys tca val asp gly pro gln leu gly ile ala thr gly asp tyr his his pro
 481/161
 cgg gct gat c
 arg ala asp

SEQ ID N° 17C'

FEUILLE DE REMPLACEMENT (REGLE 26)

61/185

séquence Rv1303 prédite par Cole et al. (Nature 393:537-544) et contenant partiellement Seq17A'

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1/1 31/11
atg aag aca caa ggg cag gac gcg cag ttg ggg ttt ccc tct ggt gcf ttc cgt ccg gtt
met thr thr pro ala gln asp ala pro leu val phe pro ser val ala phe arg pro val
51/21 91/31
cgc att ttt ttc atc aac gtt gga ctg gcc gca gtg ggg arg tgg gtc gcc ggc gtg ttc
arg leu phe phe ile asn val gly leu ala ala val ala met leu val ala gly val phe
121/41 151/51
ggc cac ctg acg gtc ggg atg ttc tgg ggt ctc ggg tgg ctg ctg ggt ttc ctc aat gcc
gly his leu thr val gly met phe leu gly leu gly leu leu gly leu leu asn ala
181/61 211/71
ctg ctg gtg cgg cgt tgg gcc gag tgg atc acc gcc aaa gag caa cgg tta aaa cgg tgg
leu leu val atg arg ser ala glu ser ile thr ala lys glu his pro leu lys arg ser
241/81 271/91
atg gcc ctc aac tgg gaa tgg cga ctg gcc att atc acc atc ctc ggg ctg atc atc gcc
met ala leu thr val gly met phe ala ser arg leu ala ile ile thr ile leu gly leu ile ile ala
301/101 331/111
aac att ttc cgg ccc gct gga tgg gcc gtc att ttt tgg ctg gca ttc ttc cag gtc ctg
tyr ile phe atg pro ala gly leu gly val val phe gly leu ala phe phe gln val leu
361/121 391/131
ctg gtg gca acg aag gcc ctg cgg gtc ctg aag aag ctg cgg act ggg acc gag gaa cgg
leu val ala thr thr ala leu pro val leu lys lys leu arg thr ala thr glu glu pro
421/141 451/151
gtc gca act tat tct ccc aat gcc cag acc gcc gga tgg gaa gga cgg acc gcc acc gat
val ala thr tyr ser ser asn gly gln thr gly gly ser glu gly atg ser ala ser asp
481/161
gac tga
asp CEA

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SEQ ID N° 17D

FIGURE 17D

Drd d'après Cole et al. (Nature 393:537-544) et contenant Rv1303

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1/1 31/11
tga ggt gcc gca gtg acg aca cca ggg cag gcc ggg ccc ttg gtt ttt ccc tct gtt gct
DRA gly ala ala val thr thr pro ala gln asp ala pro leu val phe pro ser val ala
51/21 91/31
ctc cgt ccg gtt cgc att ttt ttc atc aac gtt gga ctg gcc gca gtg ggg atg ctg gtc
phe arg pro val arg leu phe phe ile asn val gly leu ala ala val ala met leu val
121/41 151/51
gcc ggc ctg ttc ggt cag ctg aag gtc ggg arg ttc tgg ggt ctc ggg tgg ctg ctg ggt
ala gly val phe gly his leu thr val gly met phe leu gly leu leu gly leu leu gly
181/61 211/71
ttg ctc aat gcc ctg atg gtc cgg cgt tgg gcc gag tgg atc acc gcc aaa gag cac cgg
leu leu asn ala leu leu val arg arg ser ala glu ser ile thr ala lys glu his pro
241/81 271/91
tta aaa cgg tgg atg ggt ccc aac tgg gaa tgg cga ctg gcc att atc acc atc ctc ggg
leu lys arg ser ser ala leu asn ser ala ser arg leu ala ile ile thr ile leu gly
301/101 331/111
ctg atc atc gcc tac att tcc cgg ccc gcc gaa ctg ggc gcc ggc atc ggg ctg gaa ttc
leu ile ile ala tyr ile phe arg pro ala gly leu gly val val phe gly leu ala phe
361/121 391/131
ttc cag gtc ctg ctg gtc gaa aag aag gcc ctg cgg gtc ctg aag aag ctg cgc act ggc
phe gln val leu leu val ala thr thr ala leu pro val leu lys lys leu arg thr ala
421/141 451/151
acc gag gaa cgg gtc gaa acc tat tct tcc aat gcc cag acc gcc gga gga tgg gaa gga atg
thr glu glu pro val ala thr tyr ser ser asn gly gln thr gly gly ser glu gly atg
481/161
acc gcc acc gac tga
ser ala ser asp asp CEA

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SEQ ID N° 17F

FEUILLE DE REMPLACEMENT (REGLE 26)

62/185

31/11
 GTC GAA CAG GTA CGG AAG CGC CCG TCG GTC GCT CGG TCC GCT GGT ATC TCG TGT TCA GCG
 val glu gln val arg lys ala pro ser val ala arg ser ala gly ile ser cys ser ala
 61/21
 AGC CAG CGG CCG TTA AGC TGG CCG AAC AGG TCG TCT TGG GGT CGG GCA TCA CGC TCG ATG
 ser gln arg pro leu thr trp pro asn arg ser ser trp gly arg ala ser ala ser met
 121/41
 TGG CTC AGG TCG ATA CCC GAG GGG ATG GCA AGT GTC ACC CCG CCA TCC TTC CAC CTC TTT
 trp leu arg ser ile pro glu gly met ala ser val thr pro pro ser phe his leu phe
 181/61
 TCG GGT GCA AGC ATC GGG CCA TGC CTG ACG GGG AGC AGA GCG AGC CAC CGG CCC AAG AAG
 ser gly ala thr ile gly pro cys leu thr gly ser arg ala ser his arg pro lys lys
 241/81
 ATG CAG AAG ACG ACT CGC GGC CCG ACG CCG CCG AGG CCG CCG CCG CCG AAC CCA AAT CAT
 met arg lys thr thr arg gly pro thr pro arg arg pro pro arg pro asn pro asn his
 301/101
 CAG CCG GTC CCG ATG TTT TCG ACC TAC GGT ATC GCG TCG ACA GTA CTC GCG GTG CTA TCG
 gln pro val pro met phe ser thr tyr gly ile ala ser thr leu leu gly val leu ser
 361/121
 GTC GCG GGG GTC GTG GTC GGT GCG ATG ATC
 val ala ala val val leu gly ala met ile

SEQ ID N° 18A

FIGURE 18A

32/11
 TCG AAC AGG TAC CGA AGG CGC CGT CCG TCG CTC GGT CCG CTG GTA TGT GGT GTT CAG CCA
 ser asn arg tyr gly arg arg arg ser leu gly pro leu val ser arg val gln pro
 82/21
 GCC AGC GGC CGT TAA GGT GGC CGA ACA GGT GGT CTT GGG GTC GCG CAT CAG CGT CGA TGT
 ala ser gly arg GCH arg gly arg thr gly arg leu gly val gly his gln arg arg cys
 122/41
 GGC TCA GGT GGA TAC CGC AGG GGA TGG CAA GTG TCA CCG GCG CAT COT TCG ACC TGT TTT
 gly ser gly arg tyr pro arg gly trp gln val ser pro arg his pro ser thr ser phe
 182/61
 CCG GTG CAA CGA TCG GCG CAT GCG TGA CCG GCA CGA GAG CGA GCG ACC GGC CGA AGA AGA
 arg val gln arg ser gly his ala GFA arg gly ala gln pro ala thr gly pro arg arg
 242/81
 TCG GGA AGA CGA CTC GCG GCG CGA CCG CCG GGA GCG GCG GCG GCG GCG GCG GCG GCG GCG
 cys gly arg arg leu ala ala arg arg arg gly gly arg arg gly arg thr gln ile ile
 302/101
 AGC CCG TCG CGA TGT TCT CGA COT ACG GTA TCG COT CGA CAC TAC TCG GCG TCG TAT CCG
 ser arg ser arg cys ser arg pro thr val ser pro arg his tyr ser ala cys tyr arg
 362/121
 TCG CCG CCG TCG TCG TCG GTG CGA TGA TC
 ser pro arg ser cys trp val arg GFA

SEQ ID N° 18B

FIGURE 18B

FEUILLE DE REMPLACEMENT (REGLE 26)

63/185

3/1 33/11
 CGA ACA GGT ACG GAA GGC GCC GTC GGT CGC TCG GTC CGG TGG TAT CTC GTG TTC AGC CAG
 arg thr gly thr glu gly ala val gly arg ser val arg trp tyr leu val phe ser gln
 63/21 93/91
 CCA GCG GCC GTT AAC GTG GCC GAA CAG GTC GTC TTG GGG TCG GGC ATC AGC GTC GAT GTC
 pro ala ala val asn val ala glu gln val val leu gly ser gly ile ser val asp val
 123/41 153/51
 GGT CAG GTC GAT ACC CGA GGG GAT GGC AAG TGT CAC CCC GGC ATC CTT CCA CCT GTT TTC
 ala glu val asp thr arg gly asp gly lys cys his pro ala ile leu pro pro leu phe
 183/61 213/71
 GGG TGC AAC GAT CCG GCC ATG CCT GAC GGG GAG CAG AGC CAG CCA CCG GCC CAA GAA GAT
 gly cys asn asp arg ala met pro asp gly glu gln ser gln pro pro ala gln glu asp
 243/81 273/91
 CGG GAA GAC GAC TCG CCG CCG GAC GCC GCG GAG GCC GGC GCG GCG GAA CCC AAA TCA TCA
 ala glu asp asp ser arg pro asp ala ala glu ala ala ala ala glu pro lys ser ser
 303/101 333/111
 GCC GGT CCC GAT GTT CTC GAC CTA CGC TAT CGC CTC GAC ACT ACT CCG GGT GGT ATC GGT
 ala gly pro asp val leu asp leu arg tyr arg leu asp thr thr arg arg ala ile gly
 363/121
 CGC CGC GGT GGT GCT GGC TGC GAT GAT C
 arg arg gly arg ala gly cys asp asp

SEQ ID N° 18C

FIGURE 18C

partie de la séquence nucléotidique de seq18A

1/1 31/11
 GAA GGC GCT GTC GGT CGC TCG GTC CGC TGG TAT CTC GTC TTC AGC CAG CCA GCG GCC GTT
 glu gly ala val gly arg ser val arg trp tyr leu val phe ser gln pro ala ala val
 61/21 91/91
 AAC GTC GCG GAA CAG GTC CTC TTG GGG TCG GGC ATC AGC GTC GAT GTG GGT CAG GTC GAT
 asn val ala glu gln val val leu gly ser gly ile ser val asp val ala gln val asp
 121/41 151/51
 ACC CGA GGG GAT GGC AAG TGT CAC CCC GGC ATC CTT CCA CCT GTT TTC GGG TGC AAC GAT
 thr arg gly asp gly lys cys his pro ala ile leu pro pro leu phe gly cys asn asp
 181/61 211/71
 CCG GCC ATG CCT GAC GGG GAG CAG AGC CAG CCA CCG GCC GAA GAA GAT GCG GAA GAC GAC
 arg ala met pro asp gly glu gln ser gln pro pro ala gln glu asp ala glu asp asp
 241/81 271/91
 TCG CCG GCC GAC CCC GCG GAG GCC GCC GCG GCG GAA CCC AAA TCA TCA GCG GGT CCG ATG
 ser arg pro asp ala ala glu ala ala ala ala ala glu pro lys ser ser ala gly pro met
 301/101 331/111
 TTC TCG ACC TAC GGT ATC GGT TCG ACA CTA CTC GCG GTG CTA TCG GTC GCC GCG GTC GTC
 phe ser thr tyr gly ala ala ser thr leu leu gly val leu ser val ala ala val val
 361/121
 CTG GGT CCG ATG ATC
 leu gly ala met ala

SEQ ID N° 18A'

FIGURE 18A'

64/185

1/1 31/11
 CCG AAG GCG CCG TCG GTC GCT CGG TCG GCT GGT ATC TCG TGT TCA GGC AGC CAG CCG CCG
 arg lys ala pro ser val ala arg ser ala gly ile ser cys ser ala ser gln arg pro
 51/21 91/51
 TTA ACG TGG CCG AAC AGG TCG TCT TGG GGT CCG GCA TCA GGG TCG ATG TCG CTC AGG TCG
 leu thr trp pro asn arg ser ser trp gly arg ala ser ala ser met trp leu arg ser
 121/41 151/51
 ATA CCC GAG GGG ATG GCA AGT GTC ACC CCG CCA TCC TTC CAC CTC TTT TCG GGT CCA ACG
 ile pro glu gly met ala ser val thr pro pro ser phe his leu phe ser gly ala thr
 181/61 211/71
 ATC GGG CCA TGC CTG ACG GGG AGC AGA CCG AGC CAC GGG CTC AAG AAG ATG CCG AAG ACG
 ile gly pro cys leu thr gly ser arg ala ser his arg pro lys lys met arg lys thr
 241/81 271/91
 ACT CGC GGC CCG ACG CCG CCG AGG CCG CCG CCG CCG AAC CCA AAT CAT CAG CCG GTC CGA
 thr arg gly pro thr pro arg arg pro pro arg pro asn pro asn his gln pro val arg
 301/101 331/111
 TGT TCT CGA CTT ACG GTA TCG CCT CCA CAC TAC TCG GAG TGC TAT CCG TCG CCG CCG TCG
 cys ser arg pro thr val ser pro arg his tyr ser ala cys tyr arg ser pro arg ser
 361/121
 TCG TGG GTG CGA TGA TC
 cys trp val arg opa

SEQ ID N° 18B'

FIGURE 18B'

1/1 31/11
 GGA AGG GGC GGT CCG TCG CTC GGT CCG CTG GTA TCT GGT GTT CAG GCA GGC AGC GGC GGT
 gly arg arg arg arg ser leu gly pro leu val ser arg val gln pro ala ser gly arg
 51/21 91/31
 TAA CTT GGC CGA ACA GGT GGT CTT GGG GTC GGG CAT CAG CGT CCA TGT GGC TCA GGT CGA
 och arg gly arg thr gly arg leu gly val gly his gln arg arg cys gly ser gly arg
 121/41 151/51
 TAC CCG AGG GGA TGG CAA GTG TCA CCC CCG CAT GGT TCG ACC TGT TTT CCG GTC CAA CGA
 tyr pro arg gly asp gln val ser pro arg his pro ser thr ser phe arg val gln arg
 181/61 211/71
 TCG GGC CAT GGC TGA CCG GGA GCA GAG CCA GGC ACC GAG GCA AGA AGA TGG GGA AGA CGA
 ser gly his ala opa arg gly ala glu pro ala thr gly pro arg arg cys gly arg arg
 241/81 271/91
 CTC GGC GGC CCA CCG CCG GGA GGC CCG CCG GGC CCA ACC CAA ATC ATC AGC CCG TCC GAT
 leu ala ala arg arg arg gly gly arg arg gly arg thr gln ala ile ser arg ser asp
 301/101 331/111
 GTT CTC GAC CTA CCG TAT CCG CTC GAC ACT ACT CCG GGT GGT ATC GGT CCG CCG GGT GGT
 val leu asp leu arg tyr arg leu asp thr thr arg arg ala ile gly arg arg gly arg
 361/121
 GGT GGT TGC GAT GAT C
 ala gly cys asp asp

SEQ ID N° 18C'

FIGURE 18C'

FEUILLE DE REMPLACEMENT (REGLE 26)

65/185

séquence Av0199 prédite par Cole et al. (Nature 383:537-544) et contenant seq18A'

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1/1                               31/11
atg cct gac ggg gag cag agc tag cca ccg gcc caa gaa gat ggg gaa gac gac tgg cgg
Met pro asp gly glu gln ser gln pro pro ala gln glu asp ala glu asp asp ser arg
61/21                               31/31
ccc gac gcc ggg gag gcc gcc ggg gcc gaa ccc aaa cca tca gcc ggt cgg arg ttc tgg
pro asp ala ala glu ala ala ala ala glu pro lys ser ser ala gly pro met phe ser
121/41                               151/51
acc tac ggt atc gcc tgg aca cta ctc gcc gtg cta tgg gtc gcc ggg gtc gtg ctg ggt
thr tyr gly ile ala ser thr leu leu gly val leu ser val ala ala val val leu gly
181/61                               211/71
ggg atg atc tgg tcc gca cac cgc gat gac tcc gcc gag cgt acc tcc ctg acc cgg gtc
ala met ile trp ser ala his arg asp asp ser gly glu arg thr tyr leu thr arg val
241/81                               271/91
atg ctg acc gcc gct gaa tgg acg gcc gtg ctg atc aac atg acc gcc gac aac atc gat
met leu thr ala ala glu trp thr ala val leu ile asn met asn ala asp asn ile asp
301/101                               331/111
gcc agc ctg cag cga ctg aac gac gga acg gtc ggt aac ctg acc acc gac ttc gac gct
ala ser leu gln arg leu his asp gly thr val gly gln leu asn thr asp phe asp ala
361/121                               391/131
gcc ggc cag ccc tac cgg cag gtg gty gag aag ttg cgg acc cac agc agc gcc agy atc
val val gln pro tyr arg gln val val glu lys leu arg thr his ser ser gly arg ile
421/141                               451/151
gag ggc gta ggc atc gat arg gtg aac cgc gag ctg gat acc cag tcc ggt gcc gcc cga
glu ala val ala ile asp thr val his arg glu leu asp thr glu ser gly ala ala arg
481/161                               511/171
ccg gta gta acc acc aaa ttg cca ccg ttt gcc act cgc acc gac tgg gty ctg ctg gtc
pro val val thr thr lys leu pro pro phe ala thr arg thr asp ser val leu leu val
541/181                               571/191
ggg acc tgg gtc agt gag aac gcc gcc gcc aaa ccc cag acc gty cac tgg aac ttg cgg
ala thr ser val ser glu asn ala gly ala lys pro gln thr val his trp asp leu arg
601/201                               631/211
ccc gat gtc tcc gat ggg gac gcc aag ctg atg atc tcc cgg ttg gag tgg att cca tga
leu asp val ser asp val asp gly lys leu met ile ser arg leu glu ser ile arg cpa

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SEQ ID N° 18D

FIGURE 18D

66/185

ORF d'après Cola et al. (Nature 393:537-544) et contenant Rv0199

1/1 31/11
 taa tcc gat gcc gga ttg ggt gaa atg ccc caa gta aag ggt cga gtc ctt gga atc ggt
 GCM ser asp ala gly leu gly glu ser his gin val thr gly arg val phe gly ile gly
 61/31 91/31
 att gcc ata gac tcc gat gcc gcc gcc aac gcc gga aag tgg caa aat gcc aag gcc gcc
 ile asp ile asp ser asp ala ala ala his ala gly thr leu gin ser ala lys gln gly
 121/41 151/51
 ggc caa ttc ggt ggc gtc gcc cgc gct gtc aat cgc ggc caa ttc cgc gtc caa ggt ttg
 gly gin phe gly gly val gly arg ala val aac arg gly gln phe val val gln arg leu
 181/61 211/71
 cac ccc tcc gcc ctc gac gcc ttc ctc gtc gag gaa gct gcc gta aag gtc gcc gat gcc
 his pro cys ala leu asp gly phe leu val glu glu ala gly val glu val ala asp ala
 241/81 271/91
 ctg cgc atc ggt gcc tac cgc agc aac tgc ttg gct gcc ctg gat gat cag gtc tgc cac
 leu arg ile gly ala tyr arg ser thr cys leu ala gly leu asp asp gln val ser his
 301/101 331/111
 ttg tgc ctc gcc ggc gcc gaa cag gct aac gaa gcc gcc gtc ggt cgc tgc gcc cgc tgc
 leu cys ile asp ala val glu gln ala thr glu gly ala val gly arg ser val arg trp
 361/121 391/131
 tar ccc gtc ttc agc cag cca gcc gcc gct aac gtc gcc gaa gcc gcc gta tgc tgc ggc tgc
 tyr leu val phe ser gln pro ala ala val aac val ala glu gln val val leu gly ser
 421/141 451/151
 gcc aac agc gtc gat gtc gct cag gtc gat aac cga ggc gat gcc aag tyr cac ccc gcc
 gly ile ser val leu asp val ala gln val asp thr arg gly asp gly lys cys his pro ala
 481/161 511/171
 att cct cca cct ctt ttc tgg tgc aac gat cgc gcc atg cct gcc aag gcc tgc tgc aac cag
 ile leu pro pro leu phe gly cys aac asp arg ala met pro asp gly glu gln ser gln
 541/181 571/191
 cca ccg gcc caa gaa gat gcc gaa gac gac tgc cgc gcc gat gcc gcc gcc gcc gcc gcc
 pro pro ala gln asp ala glu asp asp ser arg pro asp ala ala glu ala ala ala
 601/201 631/211
 gcc gaa ccc aac tca tca gcc ggt cgc atg ttc tgc gcc tgc ggt atc gcc tgc aac ata
 ala glu pro lys ser ser ala gly pro ser phe ser thr tyr gly ile ala ser thr leu
 661/221 691/231
 ctc gcc gtc cta tgc gtc gcc gcc gtc gtc ctc ggt gcc atg atc tgg tcc gca aac agc
 leu gly val leu ser val ala ala val val leu gly ala met ile trp ser ala his arg
 721/241 751/251
 gat gcc tcc ggt gag cgt aac tac ctg acc cgc gtc atc ctg aac gcc ctc gaa tgc agc
 asp asp ser gly glu arg thr tyr leu thr arg val met leu thr ala ala glu trp thr
 781/261 811/271
 gcc gtc ctg atc aac atg aac gcc gat aac atc gat gcc agc ctc cag cga ctg ccc gcc
 ala val leu ile aac met aac ala asp aac ile asp ala ser leu gln arg leu his asp
 841/281 871/291
 gag gcc gtc ggt caa ctc aac acc gat ttc gac gct atc ctg cag gcc tcc gaa tgc agc
 gly thr val gly gln leu aac thr asp phe asp ala val val gln pro tyr cgc gln val
 901/301 931/311
 gtc gcc aag ttc gcc acc gac acc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc
 val glu lys leu arg thr his ser ser gly arg ile glu ala val ala ile asp thr val
 961/321 991/331
 cag gcc gag cag gat gcc ccc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc
 his arg glu leu asp thr gln ser gly ala ala arg pro val val thr thr lys leu pro
 1021/341 1051/351
 cgc ttt gcc act tgc acc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc gcc
 pro phe ala thr arg thr asp ser val leu val ala thr ser val ser glu aac ala
 1081/361 1111/371
 gcc gcc aac ccc cag acc gtc ccc tgc aac tgc cgc ctc gat gta tcc gcc gtc acc gcc
 gly ala lys pro gln thr val his trp aac leu arg leu asp val ser gcc val asp gly
 1141/381 1171/391
 aac cag arg atc tcc cgc ttg gag tgc att cga tgc
 lys leu met ile ser arg leu glu ser ala arg cca

SEQ ID N° 18F

FIGURE 18F
FEUILLE DE REMPLACEMENT (REGLE 26)

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21/11
 GTT GCG CAA CGG GGT GAG CAC CGA CCG GAT GAT GGC GCA ACT ATC GAA ACT GCA GGA CAT
 val ala gln arg gly glu his arg arg asp asp gly ala thr ala glu thr ala gly his
 61/21
 CCG CAA CCG CAA CGA CCG CAC TCG CCG GGT GGG CAC ECC TGG CTA TCA GCG CAG CGT CGA
 arg gln arg gln arg arg his ser arg gly gly his pro trp leu ser gly gln arg arg
 121/41
 CTA TGT GGT AAA CAC ACT GCG CAA CAG CCG TTT TGA TGT GCA AAC CCC GGA GTT CTC CGC
 leu cys gly lys his thr ala gln gln arg phe ova cys ala asn pro gly val leu arg
 181/61
 TCG CGT GTT CAA GCG CGA AAA AGG GGT GGT GAC CCT GCG CCG CAA CAC CGT GGA GCG GAG
 ser arg val gln gly arg lys arg gly gly asp pro arg arg gln his arg gly gly glu
 241/81
 GGC GCT CGA GTA CAG CCT CCG CAC ACC GCG GGA CCG GGT GAC CCG CCC GCT GGT GGC TGC
 gly ala arg val gln pro arg his thr ala gly arg gly asp gly pro ala gly gly cys
 301/101
 CCC GCG CGA CGA CAG TCG GCG CTG CAG TCC CTC GGA CTA CGA CAG GGT GGC GGT GTC CGC
 pro arg arg arg gln ser gly leu gln ser val gly leu arg gln ala ala gly val arg
 361/121
 TGC GGT GGT GGT GGT AGA TC
 cys gly gly ala gly arg

SEQ ID N° 19A

FIGURE 19A

22/11
 TTG CGC AAC GGG GTG AGC ACC GAC GCG ATG ATG CCG CAA CTA TCG AAA CTG CAG GAC ATC
 leu arg asn gly val ser thr asp ala met met ala gln leu ser lys leu gln asp ala
 62/21
 GGC AAC GGC AAC GAC GGC ACT CCG GCG GTG GCG ACC CTT GGT TAT CAG GCG AGC GTC GAC
 ala asn ala asn asp gly thr arg ala val gly thr pro gly tyr gln ala ser val asp
 122/41
 TAT GTG GTA AAC ACA CTG CCG AAC AGC GGT TTT GAT GTG CAA AAC CCG GAG TTC TCG GGT
 tyr val val asn thr leu arg asn ser gly phe asp val gln thr pro glu phe ser ala
 182/61
 CCG GTG TTC AAG GCG GAA AAA GCG GTG GTG ACC CTC GCG GCG AAC ACC CCG GAG GCG AGG
 arg val phe lys ala glu lys gly val val thr leu gly gly asn thr val glu ala arg
 242/81
 GCG CTC GAG TAC AGC CTC GCG ACA CCG CCG GAC GCG GTG AGC GCG CCG CTG GTG GCT GCG
 ala leu gln tyr ser leu gly thr pro pro asp gly val thr gly pro leu val ala ala
 302/101
 CCG GCG GAC GAC ACT CCG GCG TGC AGT CCG TCG GAC TAC GAC AGG CTG CCG GTG TCC GGT
 pro ala asp asp asp pro gly cys ser pro ser asp tyr asp arg leu pro val ser gly
 362/121
 GCG GTG GTG CTG GTA GAT C
 ala val val leu val asp

SEQ ID N° 19B

FIGURE 19B

68/185

33/11
 TGC GCA ACG GGG TGA GCA CGC ACG CGA TGA TGC CGC AAC TAT GGA AAC TGC AGG ACA TCG
 cys ala thr gly GPa ala pro thr arg GPa trp arg asp tyr arg asp cys arg thr ser
 63/21
 CCA ACG CCA ACG ACG GCA CTC GCG CGG TGG GCA CGC TTG GCT ATC AGG CCA CGC TCG ACT
 pro thr pro thr thr ala leu ala arg trp ala pro leu ala ile arg pro ala ser thr
 123/41
 ATG TGG TAA ACA CAC TGC GCA ACA GCG GTT TTG ATG TGC AAA CCC CGG AGT TGT CCG CTC
 met trp OGh thr his cys ala thr ala val leu met cys lys pro arg ser ser pro leu
 183/61
 GCG TGT TCA AGG CGG AAA AAG GCG TGG TGA CCC TCG CGC GCA ACA CCG TGG AGC CGA GCG
 ala cys ser arg pro lys lys gly trp GPa pro ser ala ala thr pro trp arg arg gly
 243/81
 CGC TCG AGT ACA GGC TCG GCA CAC CGC CGG ACG GGG TGA CGG GGC CGC TGG TGG TTG CCC
 arg ser ser thr ala ser ala his arg arg thr gly GPa arg ala arg trp trp leu pro
 303/101
 CGC CGG ACG ACA CTC CGG GCT GCA CTC CGT CGG ACT ACG ACA GCG TGC CGG TGT CCG GTG
 pro pro thr thr val arg ala ala val arg arg thr thr thr gly cys arg cys pro val
 363/121
 CGG TGG TGC TGG TAG ATC
 arg trp cys trp AMB ale

SEQ ID N° 19C

FIGURE 19C

partie de la séquence nucléotidique de seq19A

1/1
 CTA TCG AAA CTG CAG GAC ATC GGC AAC GCG AAC GGC ACT CGC GCG CTC GGC ACC CCT
 leu ser lys leu gin asp ile ala asp ala asp asp gly thr arg ala val gly thr pro
 61/21
 GGC TAT GAC GGC AGC GTC GAC TAT GTG GTA AAC ACA CTG CGC AAC AGC GGT TTT GAT GTG
 gly tyr gin ala ser val asp tyr val val asp thr leu arg asp ser gly phe asp val
 121/41
 CAA ACC CGG GAG TTC TCC GCT CGC GTG TTC AAG GCC GAA AAA GGG GTG GTG ACC CTC GGC
 gin thr pro glu phe ser ala arg val phe lys ala glu lys gly val val thr leu gly
 181/61
 GGC AAC ACC GTG GAG GCG AGG GCG CTC GAG TAC AGC CTC GGC ACA CCG CGG GAC GCG GTG
 gly asp thr val glu ala arg ala leu glu lys ser leu gly thr pro pro asp gly val
 241/81
 ACG GGC CGG CTG CTG GGT GGC GGC GGC GAC GAC AAT CGC GCG TAC AAT CGC TCG GAC TAC
 thr gly pro leu val ala ala pro ala asp asp ser pro gly cys ser phe ser asp tyr
 301/101
 GAC ACG CTG CGG GTG TCC GGT GCG GTG GTG CTG GTA GAT C
 asp arg leu pro val ser gly ala val val leu val asp

SEQ ID N° 19A'

FIGURE 19A

69/185

1/1 31/11
 TAT CGA AAC TGC AGG ACA TCG CCA ACG CCA ACG ACG GCA CTC GCG GCG TGG GCA CCC CTG
 tyr arg asn cys arg thr ser pro thr pro thr thr ala leu ala arg trp ala pro leu
 61/21 91/31
 GCT ATC AGG CCA GCG TCG ACT ATG TGG TAA ACA CAC TGC GCA ACA GCG GTT TTG ATG TGC
 ala ile arg pro ala ser thr met trp och thr his cys ala thr ala val leu met cys
 121/41 151/51
 AAA CCC CGG AGT TCT CCG CTC GCG TGT TCA ACG CCG AAA AAG GCG TGG TGA CCG TCG GCG
 lys pro arg ser ser pro leu ala cys ser arg pro lys lys gly trp oia pro ser ala
 181/61 211/71
 GCA ACA CCG TGG AGG CGA GCG GCG TCG AGT ACA GCG TCG CCA CAC CCG CCG ACG GCG TGA
 ala thr pro trp arg arg gly arg ser ser thr ala ser ala his arg arg thr gly oia
 241/81 271/91
 CGG GCG CCG TGG TGG CTC CCG CCG CCG ACG ACA GTC CCG GGT GCA GTC GGT CCG ACT ACG
 arg ala arg trp trp leu pro pro pro thr thr val arg ala ala val arg arg thr thr
 301/101 331/111
 ACA GCG TGC CCG TGT CCG GTC CCG TGG TGC TGG TAG ATC
 thr gly cys arg cys pro val arg trp cys trp ANB ile

SEQ ID N° 19B'

FIGURE 19B'

1/1 31/11
 ATC GAA ACT GCA GGA CAT CCG CAA CCG CAA CGA CCG CAC TCG CCG GGT GCG CAC CCC TGG
 ile glu thr ala gly his arg gln arg gln arg arg his ser arg gly gly his pro trp
 61/21 91/31
 CTA TGA GCG CAG GGT GGA CTA TGT GGT AAA CAC ACT CCG CAA CAG CCG TTT TGA TGT GCA
 leu ser gly gln arg arg leu cys gly lys his thr ala gln gln arg phe oia cys ala
 121/41 151/51
 AAC CCC GGA GTT CTC CCG TCG CGT GTT CAA GCG CCA AAA AAG GGT GGT GAC CCT CCG CCG
 asn pro gly val leu arg ser arg val gln gly arg lys arg gly gly asp pro arg arg
 181/61 211/71
 CAA CAC CGT GGA CCG GAG GGC GCT CCA GTA CAG CTT CCG CAC ACC CCG GGA CCG GGT CAC
 gln his arg gly gly glu gly ala arg val gle pro arg his thr ala gly arg gly asp
 241/81 271/91
 GCG CCG GCT GGT GGC TGC CCC CCG CCA CAG TCG GCG CTC CAG TCC GTC CCA CTA CCA
 gly pro ala gly gly cys pro arg arg arg gln ser gly leu gln ser val gly leu arg
 301/101 331/111
 CAG GCT GCG GGT GTC CCG TGC GGT GGT GGT GGT AGA TC
 gln ala ala gly val arg cys gly gly ala gly arg

SEQ ID N° 19C'

FIGURE 19C'

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sequence Rv0418 prédite par Cole et al. (Nature 393:537-544) et contenant seq18A'

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1/1                               31/11
atg gtg aac aaa tcc aag atg atg cgg ggg gtg ctg gcc gtg gct gty gtc gtc gca ttc
Met val asn lys ser arg met met pro ala val leu ala val ala val val ala phe
61/21                               91/31
ctg acg acg ggc tgt atc cgg tgg tct acg cag tgg cgg ccc gtt gtt aac ggc tcc gct
leu thr thr gly cys ile arg trp ser thr gln ser acg pro val val asn gly pro ala
121/41                               151/51
gcc gca gag ttc gcc ttc ggg ttg tgg aac cgg gtg agc acc gac gcg atg atg ggc cac
ala ala glu phe ala val ala leu arg asn arg val ser thr asp ala met met ala his
181/61                               211/71
cta tgg aaa ctg cag gac atc gcc aac gcc aac gaa ggc att cgc gcg gtg ggc acc cct
leu ser lys leu gln asp ile ala asn ala aac asp gly thr arg ala val gly thr pro
241/81                               271/91
ggc tat cag gaa agc gtc gac tat gtg gta aac aca ctg cgc aac agc ggt ttt gac gtg
gly tyr gln ala ser val asp tyr val val asn thr leu arg asn ser gly phe asp val
301/101                              331/111
caa acc cgg gag ttc tcc gct cgc gtg ttc aag gcc gaa aaa ggg gtg gty acc ctg gcc
gln thr pro glu phe ser ala arg val phe lys ala glu lys gly val val thr leu gly
361/121                              391/131
ggc aac acc gtg gag cgc agc ggc gtc gag tac agc ctg ggc aca cgg cgg gac ggg gtg
gly asn thr val glu ala arg ala leu glu tyr ser leu gly thr pro pro asp gly val
421/141                              451/151
acc ggc cgg ctg gtg gct gcc ccc gcc gcc gac agc cgg ggc tgc agt cgg tcc gac tac
thr gly pro leu val ala ala pro ala asp asp ser pro gly cys ser pro ser asp tyr
481/161                              511/171
gac agc ctg cgg gtg tcc ggt ggc gtg gtc ctg gta gat cgc gcc gtc tgt cct ttt gcc
asp arg leu pro val ser gly ala val val leu val asp arg gly val cys pro phe ala
541/181                              571/191
cag aag gaa gac gca gcc gcc cag cgc ggt cgg gtg ggg ctg atc att gct gac aac atc
gln lys glu asp ala ala ala gln arg gly ala val ala leu ile ile ala asp asn ile
601/201                              631/211
gac gag cag cgc atg ggc ggc aac ctg ggg gct aac acc gac gtc aag aac cgg gtg gty
asp glu gln ala met gly gly thr leu gly ala asn thr asp val lys ile pro val val
661/221                              691/231
agt gtc acc aag tgg gtc gga ttc cag cta cgc gga cag tct ggg cca acc acc gtc aag
ser val thr lys ser val gly phe gln leu arg gly gln ser gly pro thr thr val lys
721/241                              751/251
ccc acg ggc gcc acc aaa agt ttc aag gcc cgc aac gtc atc ggc cag acg aag acg ggg
leu thr ala ser thr gln ser phe lys ala arg asn val ile ala gln thr lys thr gly
781/261                              811/271
cag gtc gcc aac gtg gty atg gca ggt ggc car tgg gac agc ttc cag gaa gga acc ggc
ser ser ala asn val val met ala gly ala his leu asp ser val pro glu gly pro gly
841/281                              871/291
atc aac gac aac gcc tgg gga gty gct ggc gtc ctg gaa cgg gca gty cag ctg ggc aac
ile asn asp asn gly ser gly val ala ala val leu glu thr ala val gln leu gly asn
901/301                              931/311
tca ccc cat ggc tcc aac ggc gta cgg ttc gcc ttc tgg gcc gaa gag gaa tcc ggc ctg
sar pro his val ser asn ala val arg phe ala phe trp gly ala glu glu phe gly leu
961/321                              991/331
att ggg tca cga aac tac gtc gag tgg cgg gac atc gaa ggc ttc aac gcc atc ggc ctg
ile gly ser arg asn tyr val glu ser leu asp ile asn ala leu lys gly ile ala leu

```

SEQ ID N° 19 D

FIGURE 19D

FEUILLE DE REMPLACEMENT (REGLÉ 26)

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1021/341 1091/351
 tat ctg aac ttc gac atg ttg gcg tgg cgg aac cgg ggt ttc ttc acc tac gac ggt gac
 tyr leu asn phe asp met leu ala ser pro asn pro gly tyr phe thr tyr asp gly asp
 1081/361 1111/371
 cag tgg ctg cgg cta gac gcc cgc ggt aag cgg gtg gta ccc gaa ggc tgg gcc ggt atc
 gln eer leu pro leu asp ala arg gly gln pro val val pro glu gly ser ala gly ala
 1141/381 1171/391
 gag cgc acg ttc gtc gcc tat ctg asg atg gcc gcc aag acc gcg cag gac acc tgg ttc
 glu arg thr phe val ala tyr leu lys met ala gly lys thr ala gln asp thr ser phe
 1201/401 1231/411
 gac ggt cgg tcc gac tac gcc gcc ttc acg ctg gcg ggt atc ccc tgg ggt gcc ctg ttc
 asp gly arg eer asp tyr asp gly phe thr leu ala gly ile pro ser gly gly leu phe
 1261/421 1291/431
 tcc gcc gcc gag gtc bag aag tcc gcc gag caa gcc gag ctg tgg gcc gcc acc gcc gac
 eer gly ala glu val lys lys ser ala glu gln ala glu leu trp gly gly thr ala asp
 1321/441 1351/451
 gag cct ttc gat ccc aac tat ccc cag aag aca gcc acc ctg gac met atc gcc cgc acc
 glu pro phe asp pro asn tyr his gln lys thr asp thr leu asp his ile asp arg thr
 1381/461 1411/471
 cgc ctg ggt atc aac gcc gcc gac gtc gcg tac gcg ctg ggt tgg tat gcc cag gac ctc
 ala leu gly ile asn gly ala gly val ala tgc ala val gly leu tyr ala gln asp leu
 1441/481 1471/491
 gcc gcc ccc aac ggg gtt ccg gtc atg gcg gac cgc acc cgc ccc ctg att gcc aac ccg
 gly gly pro asn gly val pro val met ala asp arg thr arg his leu ile ala lys pro
 1501/501
 tga
 opa

SEQ ID N° 19D (suite)

FIGURE 19D (suite)

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ORF d'après Cole et al. (Nature 393:537-544) et contenant Rv0418

1/1 31/11
tag gcc att cca cgc tct gtc cgt tgg att ggt cgg tgg gat cgc aac gct gca cgg cga
AHO ala ala gin arg ser val arg leu ile gly arg trp asp ala lys ala ala arg arg
61/21 91/31
cag cgc cgg tct aat ctg gcc cgc atg gtg aac aaa tcc agg atg atg cgc cgc gly trp
gin ala arg ser asn leu gly ala met val asn lys ser arg met met pro ala val leu
121/41 151/51
gcc gtg gct gtg gtc gtc gca ttc ctg aag aag ggc tgt atc cgc tgg tct aag cag tgg
ala val ala val val val ala phe leu thr thr gly cys ile arg trp ser thr gin ser
181/61 211/71
cgg ccc gtc gat aac gcc ccc gct gcc gca gag ttc gcc gtt gag ttg cgc aac cgg gtg
arg pro val val asn gly pro ala ala ala gtc phe ala val ala leu arg asn arg val
241/81 271/91
agg acc gac cgc atg atg ggc cac cta tgg aac ctg cag gac atc gcc aac gcc aac gac
ser thr asp ala met met ala his leu ser lys leu gin asp ile ala asn ala asn asp
301/101 331/111
ggc act cgc cgc gtg gcc acc cct gcc tat cag gcc agc gtc gac tat gtc gta aac act
gly thr arg ala val gly thr pro gly tyr gin ala ser val asp tyr val val asn thr
361/121 391/131
ctg cgc aac agc ggt ttt gat gtg aac acc cgg gag ttc tcc gct cga gtg ttc aag gcc
leu arg asn ser gly phe asp val gin thr pro glu phe ser ala arg val phe thr ala
421/141 451/151
gaa aac ggg gtg gtc acc ctg gcc gcc aac acc atg gag cgc agg cgc ctg gac tac agc
glu lys gly val val thr leu gly gly asn thr val glu ala arg ala leu glu tyr ser
481/161 511/171
ctc gcc acc cgc cgc gcc ggg gtg acc gcc cgc cgc ctg gtc gct gcc ccc gcc gac gac agt
leu gly thr pro pro asp gly val thr gly pro leu val ala ala pro ala asp asp ser
541/181 571/191
cgg gcc tgc agt cgc tgg gcc tac gac agc ctg ccc gly tcc ggt cgc gtg gtc gtc gta
pro gly cys ser pro ser asp tyr asy arg leu pro val ser gly ala val val leu val
601/201 631/211
aat cgc gcc gtc tgt cct ttt gcc cag aag gaa gac gaa gcc gcc cag cgc gct cgc gly
asp arg gly val cys pro phe ala gin lys glu asp ala ala ala gin arg gly ala val
661/221 691/231
cgc ctg atc att gct gac aac atc gac gag cag cgc atc gcc gcc acc ctg ggg gct aat
ala leu ile ile ala asp asp ile asp glu gin ala met gly gly thr leu gly ala asn
721/241 751/251
acc gac gtc aag atc cgc gtg gtc agt gtc acc aag tgg gtc gga ttc cag cta cgc gga
thr asp val lys ile pro val val ser val thr lys ser val gly phe gin leu arg gly
781/261 811/271
cag tcc ggg cca acc acc gtc aag ctg aag cgc acc acc taa agt ttc aag gcc gac aac
gin ser gly pro thr thr val lys leu thr ala ser thr gin ser phe lys ala arg asn
841/281 871/291
gtc atc gcp cgc acc aag aag ggg tgg tgg gcc aac gty gtc atg gca ggt cgc aac ity
val ile ala gin thr lys thr gly ser ser ala asn val val met ala gly ala his leu
901/301 931/311
gac agc gtc cgc gaa gga gcc gcc atc aac gac aac gcc tgg gga gtc gct cgc ctc
asp ser val pro glu gly pro gly ile aac asp asn gly ser gly val ala ala val leu
961/321 991/331
gaa acc gca gtc cag ctg ggg aac tca cgc cgt gtc tcc acc cgc gta cgc acc gcc ttc
glu thr ala val gin leu gly aac ser pro his val ser asn ala val arg phe ala phe

SEQ ID N° 19 F

FIGURE 19F
FEUILLE DE REMPLACEMENT (REGLE 26)

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1021/341 1051/351
 tgg ggc gcc gag gaa ctc ggc ctg atc ggg tca cga aac tac gtc gag tgg ctg gac atc
 trp gly ala glu glu phe gly leu ile gly ser atg aen tyr val glu ser leu asp ile
 1081/361 1111/371
 gac ggc ctc aaa ggc atc ggc ctg tat cgg aac ttc gac atg ttg ggc tgg cgg aac cgg
 asp ala leu lys gly ile ala leu tyr leu aen phe asp met leu ala ser pro aen pro
 1141/381 1171/391
 ggt tac ttc acc tac gac ggt gac cag tog ctg cgg ata gac gcc cgc ggt cag cgg gtc
 gly tyr phe thr tyr asp gly asp gln ser leu pro leu asp ala arg gly gln pro val
 1201/401 1231/411
 gtg ccc gaa ggc tgg gcc ggt atc gag cgc acg ttc gtc gcc tat ctg aac atg gcc gag
 val pro glu gly ser ala gly ile glu arg thr phe val ala tyr leu lys met ala gly
 1261/421 1291/431
 aag acc ggc cag gac acc tog ttc gac ggt cgg tcc gac tac gac gcc ttc acg ctg cgg
 lys thr ala gln asp thr ser phe asp gly acg ser asp tyr asp gly phe thr leu ala
 1321/441 1351/451
 ggt atc cct tog ggt ggc ctg ttc tcc gcc gct gag gtc aag aag tcc gcc gag caa gcc
 gly ile pro ser gly gly leu phe ser gly ala glu val lys lys ser ala glu gln ala
 1381/461 1411/471
 gag ctc tgg ggt gcc acc gcc gac gag cct ttc gat ccc aac tat cac cag aag aca gat
 glu leu trp gly gly thr ala asp glu pro phe asp pro aen tyr his gln lys thr asp
 1441/481 1471/491
 acc ctg gac ccc atc gac cgc aca ggc ctc ggt aic aac ggc gct ggc gtc gcy tac ggc
 thr leu asp his ile asp arg thr ala leu gly ile aen gly ala gly val ala tyr ala
 1501/501 1531/511
 gtg ggt tgg tat ggc cag gac ctc gcc gcc ccc aac ggg gtt cgg gtc atg ggc gac cgc
 val gly leu tyr ala gln asp leu gly gly pro aen gly val pro val met ala asp arg
 1561/521
 acc cgc ccc tgg att gcc aaa cgg tga
 thr arg his leu ile ala lys pro opa

SEQ ID N° 19F (suite)

FIGURE 19F (suite)

31/11
 CGA GAC AGT GGT GCG GGA CAC TTG AGT TCG GCT GGT AAC GAC GCG AGA GTC GCG GCG TTC
 arg asp ser gly ala gly his leu ser aen ala ala aen asp ala arg val ala arg phe
 61/21 91/31
 CCG GGT GTG GGA CTC ACG TTC GGT GAG GGT ACA GCG GAC CTT CGA GCA CCG AAT ATC GTS
 arg gly val gly leu thr phe gly glu gly thr ala asp leu arg ala arg aen ile val
 121/41 151/51
 GCG CAG CTG GCA ACC CTC GGT TTC GAC GTT GGT GAC GAC CCC TCG TTC ATG AAT CGT TGT
 gly arg leu ala thr val gly phe asp val gly asp asp pro ser phe met aen arg ser
 181/61 211/71
 TGA GCT CCC GGT TTT GGT GGA TCG CCA GGC ACC GCG GGT ACT GGT GCG GTT AAG GTT GTC
 GGA ala pro arg phe ala gly cys pro gly thr ala gly thr ala ala leu lys leu val
 241/81 271/91
 GCA CAT GGT GCG GCG AAG GAG GAA CAG TGG GCA ACG ACC TAG CCG CCG TCG CCG GCG TGG
 ala his gly ala gly arg glu glu gln trp ala ser ser AMB pro arg ser pro arg trp
 301/101 331/111
 TCG GTG CGT GCA TGC TCG CAG CCG GAT GCA CTA ACG TGG TCG ACG GGA CCG CCG TCG CTG
 ser val arg ala cys ser gln pro asp ala pro thr trp ser thr gly pro pro trp leu
 361/121
 CCG ACA AAT CCG GAC CAC TGC ATC AGG ATC
 pro thr aen pro asp his cys ala arg ile

SEQ ID N° 20A

FEUILLE DE REMPLACEMENT (REGLE 26)

FIGURE 20A

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32/11
 GAG ACA GTG CTG CGG GAC ACT TGA GTT CCG CTG CTA ACG ACG CCA GAG TGG CGC GCT TCC
 glu thr val val arg asp thr OPA val arg leu leu thr thr pro glu ser pro ala ser
 62/21
 GCG GTG TGG GAC TCA CGT TCG GTG AGG GTA CAG CGG ACC TTC GAG CAC GCA ATA TGG TGG
 ala val trp asp ser arg ser val arg val gln arg thr phe glu his ala ile ser trp
 122/41
 GCC GCG TGG CAA CCG TCG GTT TCG ACG TTG GTG ACG ACC CCT CGT TCA TGA ATC GTT CTT
 ala gly trp gln pro ser val ser thr leu val thr thr pro arg ser OPA ile val leu
 182/61
 GAG CTC CCC GTT TTG CTG GAT GCC CAG GCA CCG CCG GTA CTG CTG CCG TTA AGC TTG TCG
 glu leu pro val leu leu asp ala gln ala pro pro val leu leu arg leu ser leu ser
 242/81
 CAC ATG GTG CCG GCA GGG AGG AAC AGT GGG CAA GCA GCT ACC CGC GCT CGC CGC GCT GGT
 his met val pro ala gly arg asn ser gly gln ala ala ser arg ala arg arg ala gly
 302/101
 CGG TCG GTG CAT GCT CGC AGC CCG ATG CAC CAA CGT GGT CGA CCG GAC CGC CGT GGC TGC
 arg cys val his ala arg ser arg met his gln arg gly arg arg asp arg arg gly cys
 362/121
 CCA CAA ATC CCG ACC ACT GCA TCA GGA TC
 arg gln ala arg thr thr ala ser gly

SEQ ID N° 208

FIGURE 208

33/11
 AGA CAG TGG TGC GGG ACA CTT GAG TTC GGC TGC TAA CGA CAC CAG AGT CGC CCG GTT CCG
 arg gln trp cys gly thr leu glu phe gly cys GCH arg arg gln ser arg pro leu pro
 63/21
 CCG TGT GGG ACT CAC GTT CCG TGA GGC TAC AGC GGA CCT TCG AGC ATG CAA TAT GGT GGG
 arg cys gly thr his val arg OPA gly tyr ser gly pro ser ser thr gln tyr arg gly
 123/41
 CCG GCT GGC AAC CGT CCG TTT CGA CGT TGG TGA CGA CCC CTC GTT CAT GAA TCG TTC TTG
 pro ala gly asn arg arg phe arg arg trp OPA arg pro leu val his glu ser phe leu
 183/61
 AGC TCC CCG TTT TGC TGG ATG CCC AGG CAC CGC CCG TAC TGC TGC GCT TAA GGT TGT CGC
 ser ser pro phe cys trp met pro arg his arg arg tyr cys cys ala GCH ala cys arg
 243/81
 ACA TGG TGC CCG CAG GGA GCA ACA GTG GGC AAG CAG CTA GCT GCG CTC CGC GCG GTG GTC
 thr trp cys arg gln gly thr val gly lys gln leu ala ala leu ala ala leu val
 303/101
 GGT GCG TGC ATG CTC GCA GCG GGA TGC ACC AAC GTG GTC GAC GAG ACC GGC GTG GGT GGC
 gly ala cys met leu ala ala gly cys thr asn val val asp gly thr ala val ala ala
 363/121
 GAC AAA TCC GGA GGA CTC CAT CAG GAT C
 asp lys ser gly pro leu his gln asp

SEQ ID N° 209

75/185

partie de la séquence nucléotidique de seq20A

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1/1                               31/11
TGT GGG ACT CAC GTT CCG TGA GGG TAC AGC GGA CTT TGG AGC ACG CAA TAT CGT GGG CCG
cys gly thr his val arg opa gly tyr ser gly pro ser ser thr gin tyr arg gly pro
61/21                               91/31
GCT GGC AAC CST CCG TTT CGA CGT TGG TGA CGA CCC CTC GTT CAT GAA TCG TTC TTG AGC
ala gly asn arg arg phe arg arg trp opa arg pro leu val his glu ser phe leu ser
121/41                               151/51
TCU CCG TTT TGC TGG ATG CCC AGG CAC CGG GGG TAC TGC TGC GCT TAA GGT TGT GGC ACA
ser pro phe cys trp met pro arg his arg arg tyr cys cys ala OCH ala cys arg thr
181/61                               211/71
TGS TGC CCG CAG GGA GGA ACA GTG GGC AAG CAG CTA GCC GCG CTC GCC GCG CTG CTC GGT
trp cys arg gin gly gly thr val gly lys gin leu ala ala leu ala ala leu val gly
241/81                               271/91
GCS TGC ATG CTC GCA GCC GGA TCC ACC AAC CTC CTC SAC GCG ACC GCC CTG GGT GCG GAC
ala cys met leu ala ala gly cys thr asn val val asp gly thr ala val ala ala asp
301/101
AAA TCC GGA CCA CTC CAT CAG GAT C
lys ser gly pro leu his gin asp

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SEQ ID N° 20A'

FIGURE 20A'

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1/1                               31/11
GTG GGA CTE ACG TTC GGT GAG GGT ACA GCG GAC CTT CGA GGA CCC AAT ATC GTG GGC CCG
val gly leu thr phe gly glu gly thr ala asp leu arg ala arg asn ile val gly arg
61/21                               91/31
CTG GCA ACC CTC GGT TTC GAC GTT GGT GAC GAC CCC TGG TTC ATG AAT CGT TGT TGA GGT
leu ala thr val gly phe asp val gly asp asp pro ser phe met asn arg ser opa ala
121/41                               151/51
CCC CST TTT GCT GGA TGC CCA GGC ACC GCG GGT ACT CTT GCC CTT AAG CTT GTC GCA CAT
pro arg phe ala gly cys pro gly thr ala gly thr ala ala leu lys leu val ala his
181/61                               211/71
GGT GGC GGC AGG GAG GAA CAG TGG GCA AGC ASE TAG CCG CCG TCG CCG CCG TCG TCG GTG
gly ala gly arg glu glu gin trp ala ser ser ASE pro arg ser pro arg trp ser val
241/81                               271/91
CGT GCA TGC TCG CAG CCG SAT GCA CCA ACC TGG TGG ACG GGA CCG CCG TGG CTG GCG ACA
arg ala cys ser glu pro asp ala pro thr trp ser thr gly pro pro trp leu pro thr
301/101
AAT CCG GAC GAC TGC ATC AGG ATC
asn pro asp his cys ile arg ile

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SEQ ID N° 20B'

FIGURE 20B'

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1/1 31/11
 GTG TGG GAC TCA CGT TCG GGG AGG GTA CAG CGG ACC TTC GAG CAC GCA ATA TGG TGG GGC
 val trp asp ser arg ser val arg val gln arg thr phe glu his ala ile ser trp ala
 61/21 91/31
 GGC TGG CAA CGC TCG GTT TCG AGC TTG GTG ACC ACC GCT GGT TCA GGA ATC GGT GTT GAG
 gly thr gln pro ser val ser thr leu val thr thr pro arg ser GGA ile val leu glu
 121/41 151/51
 CTC CGC GTT TTG CTG GAT GCC CAG GCA CGC GGA CTG CTG GGC GTA AGC TTG TCG CAC
 leu pro val leu leu asp ala gln ala pro pro val leu leu arg leu ser leu ser his
 161/61 211/71
 ATG GTS CGC GCA CGG AGG AAC AGT TGG CAA GCA GCT ACC GGC GGT CGC GGC GCT GGT CGG
 met val pro ala gly arg asn ser gly gln ala ala ser arg ala arg ala gly arg
 241/81 271/91
 TGC CTG GAT GCT CTC AGC CGG ATG CAC CAA CGT GGT GGA GCG GAC GGC GGT GGC TGC GCA
 cys val his ala arg ser arg met his gln arg gly arg arg asp arg arg gly cys arg
 301/101
 CAA ATC CGG AGC ACT GCA TCA GGA TC
 gln ile arg thr thr ala ser gly

SEQ ID N° 20C'

FIGURE 20C'

séquence Hv3576 prédite par Cole et al. (Nature 393:837-844) et contenant seq20A'
 1/1 31/11
 atg ggc aag cag cta gcc ggc ctc gcc gcc ctg gtc ggt ggc tgc atg ctc gaa gcc gga
 met gly lys gln leu ala ala leu ala ala leu val gly ala cys met leu ala ala gly
 61/21 91/31
 tgc acc aac gtc gac gac ggc acc gcc gtc gct gcc gac aac tcc gaa cca ctg cat cag
 cys thr asn val val asp gly thr ala val ala ala ala asp lys ser gly pro leu his gln
 121/41 151/51
 gat cgc ata ccy gtt tca gcc gtt gaa ggc ctg ctc ctc gac ttg agc cag atc aat gcc
 asp pro ile pro val ser ala leu glu gly leu leu leu asp leu ser gln ile asn ala
 161/61 211/71
 ggc ctg gtt gcc aca tgc atg aag gtc tgc ttc aac gcc aag gaa aty tgc gac tgg agc
 ala leu gly ala thr ser met lys val trp phe asn ala lys ala met trp asp trp ser
 241/81 271/91
 aag agc gty gcc gac aag aat tgn ctg gtt atc gcc gat tca gaa cag gaa aag gtc tat
 lys ser val ala asp lys asn cys leu ala ile asp gly pro ala gln glu lys val tyr
 301/101 331/111
 gcc gcc acc gcc ggc acc gct atg cgc gcc caa cgg ctg gac gac agc atc gat gac tcc
 ala gly thr gly trp thr ala met arg gly gln arg leu asp asp ser ile asp asp ser
 361/121 391/131
 aag aaa cgc gac caa taa gcc att caa gcc gtc gtc agc ttc cgc acc gaa cat gat gcc
 lys lys arg asp his tyr ala ile gln ala val val gly phe pro thr ala his asp aat
 421/141 451/151
 gag gag ttc tac agc tcc tgc gtc caa agc tgg agc agc tgc tgc aac cgc att gtc
 glu glu phe tyr ser ser ser val gln ser trp ser ser cys ser asn arg arg phe val
 481/161 511/171
 gaa gcc acc cgc gga cag gac gac gcc gcc tgg acc gty gct gac gtt gcc aac gac aat
 glu val thr pro gly gln asp asp ala ala trp thr val ala asp val val asn asp aac
 541/181 571/191
 gcc aac ttc agt agc tcc aag gtc cag gaa gcc gcc gac gga tgg acc ttc aag gct gcc
 gly met leu ser ser ser gln val gln glu gly gly asp gly tyr thr cys gln arg ala
 601/201 631/211
 ctg aat gcc cgc aac aac gtc acc gcc acc gct gtc atg tgc gcc tcc agc caa cgc gat
 leu thr ala arg asn asn val thr ile asp ile val thr cys ala tyr thr gln pro asp
 661/221 691/231
 ctg gtc gcc att gcc atc gct aac caa atc gcc gcc aag gtt gcc aag cag tag
 leu val ala ile gly ile ala asn gln ile ala ala lys val ala lys gln amh

SEQ ID N° 20D

FIGURE 20D
 FEUILLE DE REMPLACEMENT (REGLE 26)